December 1990 Vol. 4 Nº 3 Price £2.00

Archive

The Subscription Magazine for Archimedes Users

Improve your DTP

Extended Memory on PC Emulator

Using the PC Emulator – 6

Reviews: StopPress, !VDE, ArcComm, Acom, RISC-OS Terminals, The WIMP Game, Rhapsody, Talisman, TinyDraw & Tiny Logo.

We're in!

We're in! – We have successfully moved into our new premises at 96a Vauxhall Street and at last have room to breath. The front room of 18 Mile End Road was fun while it lasted but after the Norwich Computer Services triffid had spread to several other rooms in the house, it was time to move it out.

Archive goes back to its roots

You may (or may not!) be interested to know that the building we have bought for our new offices used to belong to W.H.Hutchins & Sons, printers. So what?! Well, they are the people who print Archive magazine. In other words, we are now sitting in the very room where the first Archive magazine was printed. Fascinating stuff, huh?!

Visitors welcome

If you want to collect an order of goods from the new offices, give us a ring and arrange a time to pop in. Vauxhall Street is just off the inner ring road (Chapelfield Road) but as the ring road is dual carriageway at that point, you have to be travelling in the right direction to turn into Vauxhall Street. The easiest way to find us is to come round the outer ring road to either the A11 or the A140 on the south side of Norwich then head in towards the city. These two roads (Newmarket Road and Ipswich Road) join together at a traffic lights outside the huge Norfolk and Norwich hospital about 400 yards before hitting a round about on the inner ring road. Turn left at that roundabout (St Stephens) into Chapelfield Road. Vauxhall Street is on the left past the R.A.C. offices just before you get to the next roundabout. We are 200 yards down Vauxhall Street on the right behind "Pinks Catering". Either park on Vauxhall Street or turn in beside Pinks' and then REVERSE onto our forecourt. We'll explain why when you get here!

Here's wishing you a Happy Christmas from all the staff at Norwich Computer Services.

Paul Sue. Julian Alan

Government Health Warning – Reading this could seriously affect your spiritual health.

Sorry, no time for anything to do with God or Jesus this month. I'm far too busy getting ready for Christmas!

Hang on, there must be something wrong there...

Archive

Volume 4 • Nº 3 • December 1990

Contents

Archive magazine is edited by Paul Beverley and published by Norwich Computer Services.
96a Vauxhall Street, Norwich, NR2 2SD. (0603-766592) *(Fax 764011)*

Products Available

• **A3000 20M SCSI drives** drop from £560 to £390. No, that's not a printing error, Oak have lopped £170 off the (Archive) price of their A3000 20M SCSI drives. The full details are given in the SCSI Column on page 15 but basically, these are full spec, auto-parking drives in external metal case for just £390 inc VAT and carriage.

• **Annual Service Kits** – We have had to put the price of annual service kits up because fan filters are more expensive than we thought and so are the batteries – or rather there isn't much discount available by buying batteries in quantity. What we have done is to put the price up to £3 each but if you buy other goods at the same time, you only need pay £2. This reflects the cost of postage and the fact that if someone's order consists of a single service kit, the admin costs are (proportionately) much higher.

• **Arcscan III** – Beebug have now produced a multitasking RISC-OS version of Arcscan at £14.95 (member's price) or £18.95 for non-members. There is an upgrade from Arcscan 2 at £4.75. All prices inc VAT.

• **ARM3 upgrades galore**. The first is from from ZCL Ltd. At £399 +VAT, it is the cheapest we've seen so far, but as we haven't had a chance to look at it yet, we cannot say how it compares with the others. Beebug have also produced one, also at £399 +VAT but again, we haven't seen one.

• **Careware 11** – This contains an Apple IIe emulator written by Benoit Gilon of the Paris Archimedes User Group. Due to copyright, it is not a stand alone emulator, which means that you will have to get copies of the ROM images yourself. The disc contains a ReadMe file that explains how you obtain these. The emulator provides the following features: NCR/GTE 65C02 processor, language card, 80 column display, 128 kbyte memory model, mousetext characters, lores/mixed/page2 display modes, keyboard access through the use of 'softswitches', monitor bell subroutine emulation and disk drive with DOS 3.3 and ProDOS 8 compatibility.

• **Chocks Away2** – (Wow! That was quick! Chocks Away 1 was only announced last month.) 4th Dimension have produced a new version of Chocks Away with even smoother graphics and new scenery. The Mark 2 edition is being supplied now instead of Mark 1 and anyone wanting an upgrade (free of charge!) should send their Pilot's Flying Manual with their name and address direct to 4th Dimension (not to Archive). The manual will be returned together with a disc to convert their existing program to the new version. All black box recordings and high scores may be maintained in the conversion.

• **CIS Utilities** is a two-disc set of utilities including Pro-Copier, screen blanker, file encryption and a utility for compiling certain BASIC commands into assembly language plus many others plus some free games. £16.95 from Cambridge International Software or £16 through Archive.

• **Crisis** is a maze-type adventure 'with a difference'. £29.95 from Cambridge International Software or £27 through Archive.

• **DataKing** is an information retrieval and display system from Shenley Software. (i.e. database package + chart drawing). It is designed for children working under the National Curriculum and incorporates three levels of operation allowing it to be used at all four key stages – children aged five to sixteen. The idea is to provide a package that will run in a "fairly consistent way" on the various different environments encountered in schools – BBC/Master, Archimedes/A3000 and RM Nimbus. It is available in five different formats: Archimedes (inc Econet), BBC/Master stand-alone, BBC/Master Econet, Nimbus stand-alone and Nimbus network. If you buy the software in just one format, it costs £49 (no VAT) but then if you want additional formats, they are £15 each if bought at the same time. The cost includes a site licence.

• **DataTrans** is data translation program from Shenley Software, costing £18. It allows you to take data from one format and convert it to another – formats include CSV, DataKing, Key, Quest, TAB, ViewStore, etc.

• **Drummer** is a percussion sequencer for Midi. It is "easy to use" and comes with some ready made track sequences and can be used with other music programs. £19.95 from Cambridge International Software or £18 through Archive.

• **FormChem** is a library of !Draw files containing nearly 300 organic chemistry fragments together with a wide range of organic chemistry structural fragments. Form_Chem is £14.99 from G.A.Herdmann Educational Software.

• **Genesis II** is due for launch at the BETT Show in January. (Yes, I know this is supposed to be Products Available, but I think Genesis II is an extremely important new product for the Archimedes so I am breaking my usual rule.) New features will include data compression and the ability to add Armadeus sampled sounds – brilliant for, say, modern language work. The text handling facilities have been greatly improved as have the database aspects of Genesis I. Probably the most important change is the script language. In Genesis I, this just allowed simple page description and linking but now it is upgraded to a general purpose programming language allowing the user to develop complete RISC-OS applications without having to understand the complexities of the window manager. (Ian Lynch is hoping to transfer his loyalties from DTP to start a Genesis Column in the new year.) Genesis II will be £99.95 (+VAT) for education users or £149.95 inc VAT for the rest of us. (£130 through Archive)

• **InterClock** from XOB is an all-in-one Econet interface but it includes clock and terminator thus reducing the need for separate boxes, leads and power supplies. Along with it are EcoFace and EcoTerm which are a standard Econet interface and one with a built-in terminator. The idea is that all you would need would be one computer with an InterClock, one with with an EcoTerm and the rest with EcoFaces. Prices are £89.50, £46 and £39 respectively. These are ex-VAT education prices.

• **International Hangman** – Micro-Aid have produced a RISC-OS version of hangman which has the interesting extra ingredient of having sets of words in 25 different languages as well as English. The price is £10.75 +VAT.

• **Mah-Jong Patience** is played using Mah-Jong tiles – the object of the game being to remove matched pairs until you clear the board. It sounds easy but it apparently requires skill and patience and is very addictive. £19.95 from Cambridge International Software or £18 through Archive.

• **Mini-Pack 5** is a three-disc set compilation: Fish (adventure), Fireball II (breakout type game) and Pon. £29.95 from Cambridge International Software or £27 through Archive.

• **More MicroDrive courses** – for £14.95 (£14 through Archive) Cambridge International Software are selling a pair of new courses for MicroDrive.

• **Powerband** is 4th Dimension's latest offering. At £24.95 (£23 through Archive) it is an impressive looking Formula 1 simulation. It should be available by the time you get this magazine. (Their Break147 snooker game has gone back to the drawing board and is now scheduled for March 1991.)

• **Prism** is a new art package from Barry Christie, author of Art Nouveau. It is not just a RISC-OS version of Art Nouveau but "goes far beyond it in its capabilities". It is distributed by XOB and costs £61.20 +VAT for a single user or £200 for a site licence.

• **Risc User Arc Omnibus Games** – seven original games for just £12.95: Dominoes, Ogre's Lair, Pick a Pair, BallonMan, Amaze, Cribbage and Moric.

• **Risc User Special Disc Volume 3** – a host of applications, utilities and games for just £12.95. (The advert in Acorn User implies that these prices are inclusive, but Mike Williams tells me that you are supposed to add 60p p&p and then add VAT. To save you money, if you order it using the voucher in the December Acorn User, I believe they Beebug will be obliged to supply it at the price specified.)

• **RISC-OS front end for Morley Teletext Adaptor** £15 inc VAT. Ivoryash Ltd have developed a program to give a multi-tasking display for the Morley Teletext Adaptor.

• **RISC-OS printer Drivers** – Ace Computing now produce a range of RISC-OS printer drivers: HP PaintJet, Canon PJ1080A and Epson JX compatible (e.g. LC-10, XB24 colour, Citizen Swift24 colour) each at £15. Then there is Integrex at £5 and ColourCel at £25.

• **RiscType V2** – this is a full typing course from Cambridge International Software – it even includes sound effects if required! It costs £19.95 (£18 through Archive).

• **SCSI software improved** – New improved SCSI software from Oak Computers for their 16 bit SCSI interfaces is now available. £10 +VAT from Oak or

£11 inclusive through Archive. (See SCSI Column on page 15 for more details.)

• **Supersound Creations** is a four-disc set of relocatable modules of sound samples. £17.95 from Cambridge International Software or £17 through Archive.

• **Toolbox 1** is a disc from Type Mismatch containing seven RISC-OS compatible applications for £14.95 (no VAT). They are screen blanker, wastebin, doodle, dual column BASIC program lister, desktop window designer, password access to desktop, password access to files and directories.

• **VoiceBuilder** from MJD Software is a facility for creating new sound voice modules for use with other packages such as Maestro and Rhapsody. (For more details, see the advert on page 16) £19.95 + £1.50 post & packing.

Review Software Received...

We have received review copies of the following software:

DataKing and DataTrans from Shenley Software, Toolbox 1 from Type Mismatch, Carewares 4, 5, 6, 7 & 10, Sharewares 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 30, 31 & 32, Micro-Trader from Meadow Computers, PipeLine Quarterly Disc, Front end for Morley T-text adaptor, Beebug's Volume 3 Special Disc, Beebug's Arc Omnibus, International Hangman from MicroAid. A

Small Ads

• **A3000 with hard disc & memory**, PRM, Impression. For details please ring James on 0606–891011.

• **A310 colour**, IFEL 4-slot BP, 2nd internal 3.5" drive, manuals & software £625. Will separate if necessary. Phone Les on 0902–734351

• **A310 colour**, IFEL 4-slot bp, 5.25" interface, FWPlus £700. John on 0707–320723 after 8 p.m.

• **A310**, IFEL 4-slot b-plane, PC emulator £490. Phone Colin on 081–337–9306: 4 p.m. to 8 p.m.

• **A310M** + 4-slot BP £515. Canon PW-1080A £120, Phillips BM7502 green screen monitor £45. All 1st class condition. Phone 0734–771230 (day) or 0734–784897 (evenings).

• **A310M colour + 20M Acorn drive** + LC10 colour + software, £1000. Paul on 041–777–6608

• **AST TurboLaser/PS laser printer**, Adobe PostScript, 8ppm Ricoh 300 dpi engine, 3Mb RAM, 35 fonts with Centronics, RS232, and AppleTalk interfaces. £1500 ono. Contact Adrian on 0603–764114 office hours.

• **Canon PW1080A printer**, as new, £95 (+ carriage). Phone L. Scull 027–583–2979.

• **CC ROM podule + battery backup** + 32k ram + RISC-OS disc. Des Woon on 0255–880257.

• **CC ROM/RAM podule** £10, Clares' Toolkit Plus £20, Janson's ArcImEd £10, most back issues of Archive & Risc User – enquiries. Phone Paul on 0293–515201 (evenings).

• **Fractals disk**. 800k of animations, demos, patterns, 3D. State mode 20 or 21. £7. Millenium, P.O.Box 11, Ammanford, Dyfed, SA18 3WB.

• **Hard disc drive**, brand new. Phone Richard on 0482–634852 after 6 p.m.

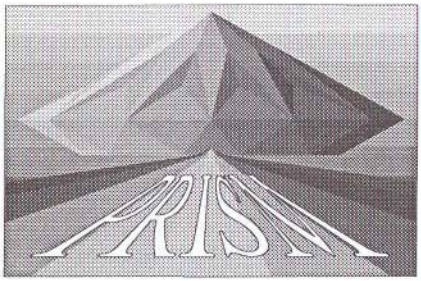
• **Pacmania** £5, Apocalypse £12, Interdictor £14, Conqueror £12. Phone Mark on 0285–654346 evenings.

• **Pawn** £10, Corruption £10, Fish £10, Solution books for Pawn, Corruption & Fish £1.50 each, PC Emulator £25, Pacmania £5, Repton 3 £7.50, Star-Trader £5, Terramex £7.50, Graphic Writer £15, Interdictor £10. Phone 0384–455066 after 6 p.m.

• **Real McCoy** games compilation £20. Phone Ian on 061–431–4621.

• **Software Developer's Toolbox** £100, Graphic-Writer £15, Artisan + Support Disc £25, Acorn DTP + many extra fonts £100. Phone 081–950–5904.

• **Charity Sales** – The following items are available for sale. All the money goes to charity but PLEASE do not just send money – ring to check availablity first. Thanks. First Word Plus 2 (as new) £45, Archimedes BBC BASIC Guides £8 each, User Guides £5 each, Brother HR15 printer with 6 daisy wheels + 2 new ribbons – any offers? (Buyer collects from Fleet, Hants.) A



A new era in art

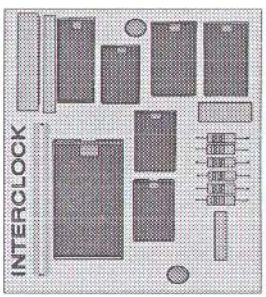
Now we have a third generation painting package for Archimedes & A3000 computers. Building on the mistakes made by others in designing earlier software has allowed us to ensure that **Prism** takes computer aided art into a new era. It provides art for the nineties.

Please compare it with any others you can find.

Prism

Please telephone or write for free brochure.

- ✔ offers more facilities than any other painting package for RISC OS
- ✔ is better value than any competing package
- ✔ saves pictures in less space than any competing package
- ✔ uses Desktop filing - compatible with all Acorn filing systems
- ✔ is more network compatible than any competing package
- ✔ comes complete with audio tape tutorial AND follow up exercises
- ✔ free video tutorial with each site or network licence
- ✔ designed in co-operation with a major regional education department



InterClock

Now it can be economical to have a network at home

InterClock is a single board easily fitted inside an Archimedes, A3000 or Master computer. Taking up less space than traditional network boards yet containing all the major components necessary to establish an Econet network it makes Acorn's well tried networking system even more affordable - it is now within reach of the enthusiast and the home and small business user.

By virtue of an agreement with **Software Solutions**, another company at the forefront of network software development, **XOB** are able to offer complete network systems based on our hardware and their software - for from as few as 2 machines (suitable for home and small business environments) up to full size networks like those used in Health and Education. **We provide full support** for the user new to networking based on years of experience in providing specialist network products to Schools, Colleges, Universities and Businesses

InterClock and our associated products are fully compatible with all existing Econet standards. They may be freely mixed with existing Econet hardware.

Interclock replaces an Econet Interface, clock AND terminator at far less cost than the more bulky traditional components. Our Econet interface boards are less expensive than any others yet offer a full specification including collision detection. **Please telephone for free details.**

Prices (ex VAT)
InterClock : £ 89-50
Econet Interface : £ 39-50
Prism single user : £61-40
Prism licence : £200-00

XOB (Dept.A),
Balkeerie,
Eassie (by Forfar),
Angus, DD8 1SR
Telephone 030 784 364

XOB

Ace Computing

RISC OS Euclid is the best multi-tasking 3D graphics and animation system for the Archimedes. It works like a 3D version of Draw, and now forms the centrepiece for a number of related products allowing the creation of complex animation sequences with the minimum of effort.

Mogul makes full use of **Euclid**'s unique hierarchical data structure to generate films of 3D objects with articulated motion and simultaneous camera motion.

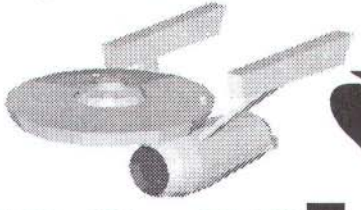
Tween produces films from Draw files. It uses techniques similar to **Mogul** and generates a film by calculating intermediate frames from a set of key positions.

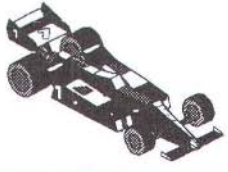
Splice allows you to edit films produced by **Mogul** or **Tween**. You can even produce hand-drawn cartoons by converting sprites from any source.

Support is provided for import and export of Sprites and Drawfiles. Films can be played by the **Projector** which comes free with **Euclid, Mogul, Splice and Tween**. Films and Euclid files can be used with Genesis.

Such is the enthusiasm for **Euclid** there is now a user group called **Elements** which provides a quarterly disk containing hints, tips, animations and user pictures like the ones in this advertisement.

Euclid £70 **Mogul** £20 **Splice** £30
Tween £30 **ArcLight** £50
Ace Computing, 27 Victoria Road,
Cambridge, CB4 3BW.
Tel: (0223) 322559
All prices include VAT and P&P.





Ace Computing

Hints & Tips

• **BASIC Text File Type** – Acorn have specified file type &FD1 for BASIC ASCII text. This is very useful for BASIC programs which are kept in !Edit format as it allows the user to define a RunType for them. For example, the following command will cause a BASIC text file to be run just like a normal BASIC file:

```
*Set Alias$@RunType_FD1 Basic
                    -quit |"%0|" %*1
```

Jim Markland, Cirencester

• **Converting old Arthur programs to RISC-OS** – Before the days of RISC-OS, programs running under the old Arthur used a form of reconfigure system to adjust the CMOS RAM settings. Now that RISC-OS is available, those programs are out of date, and are a pain, as in most cases they don't 'Boot-Up' from the desktop.

RISC-OS uses a different form of reconfiguring. Two in fact – one is the WimpSlot command, which tells the computer the minimum and maximum amount of memory the program is going to need and the other uses the module MemAlloc, found in the !Lander directory on Application disc 2.

These two things are quite easy to use. The only problem is how to find out how much room the program is going to use. This can be discovered fairly easily.

Load up the !Boot file and examine it using the BASIC Editor. What you are looking for are a set of commands/variables, which tell the computer the amount of SpriteSize/Screensize, etc it is going to need to run. To convert this, all you need is the MemAlloc module and, in a run file, use MemAlloc to allocate the memory needed for the application.

Here are some examples.

Holed Out:

1. Format a fresh new disc.

2. Create a new directory called !HoledOut

3. Copy all the files on the original Holed Out disc, except the !Boot file into the new directory.

4. Copy MemAlloc into the !HoledOut directory.

5. Use !Edit to create the following Obey file:

```
Set HoledOut$Dir <Obey$Dir>
WimpSlot -min 90k -max 90k
RMEnsure MemAlloc RMLoad
    <HoledOut$Dir>.MemAlloc
FontSize 0
RAMFSSize 0
RMASize 250
SpriteSize 240
ScreenSize 240
RMKill MemAlloc
Run <HoledOut$Dir>.HoledOut2
```

6. Load HoledOut2 into the BASIC Editor and, wherever the program loads a particular file, change it to

```
(LoadCommand) <HoleOut$Dir>.(File
    to be loaded)
```

for example

```
70 *RMLOAD BELL
```

change to

```
70 *RMLOAD <HoledOut$Dir>.Bell
```

and

```
610 CHAIN "HOLEDOUT3"
```

change to

```
610 CHAIN
    "<HoledOut$Dir>.HOLEDOUT3"
```

etc, etc.

7. Do the same as above to the file HOLEDOUT3, wherever the program loads a particular file, put the command <HoledOut$Dir>. in front of the filename.

8. Create a !Sprite file for the application icon and away you go!

Then HoledOut should run as a RISC-OS application, and will also run off a Hard Drive.

(N.B. I used Holed Out Extra Courses 1.)

Explanation of !Run file

Line 1 : Tells the computer to set a directory, and to enter it without changing the root directory whenever the <HoledOut$Dir> command is used.

Line 2 : Allocates the minimum and maximum amount of memory needed to run the application.

Line 3 : Tells the computer to look for the module MemAlloc in memory, if it isn't found then it tells the computer where to find it and loads it.

Line 4-9 : Tells the computer the memory settings the program needs.

Line 10 : Kills the module MemAlloc for more memory.

Line 11 : Runs the actual program.

Pacmania:

In this case, things are a little different. So do the following:

1. Format a new disc.

2. Create a new directory called !PacMania.

3. Copy all the files except !Boot into the new directory.

4. Use !Edit to create an Obey file containing the following...

```
Set PacMania$Dir <Obey$Dir>
Run <PacMania$Dir>.!RunLoad
```

5. Use the BASIC Editor to create a file called !RunLoad...

```
10 *Load <PacMania$Dir>.PacMania
    10000
20 CALL &10000
```

6. Create an application !Sprite file.

PacMania should then run as a RISC-OS application.

So there we are. I've also used another command to help with the loading process. <Obey$Dir> and <(Application name)$Dir>. These two commands tell the computer where to find certain files, no matter where they are. (Hidden in directories on a hard drive for example.) Duncan Burbidge

• **Getting Taxan 795 to work with Archimedes.** The Taxan 795 is an excellent multi-sync colour monitor, but it was a bit unnerving, on unpacking and assembling my new A440 with VIDC enhancer and 795 monitor, to be confronted with a screen which just would not synchronize! But, with help from Paul and from Atomwide, and with a lot of exploration, I think that I now know what screen modes it will support and how to get them.

Initially, the trick is to set *CONFIGURE MONITORTYPE 1 and *CONFIGURE WIMPMODE 20. Then the machine wakes up in the desktop in mode 20 whether or not the VIDC enhancer software (VIDCmodes for the 795) is installed, provided that (if it is not installed) the VIDC switch is 'off'. However, if VIDCmodes is not installed, loading an application which changes the mode to one of the basic Archimedes modes (0-17) plunges you back into an unsynchronized screen. Therefore, my initial explorations were done with an ordinary monochrome monitor connected to the sync BNC socket, after changing two links on the circuit board – as explained on page 434 of the RISC-OS User Guide. Options for all Acorn and Atomwide modes (except the high-resolution mono mode 23) are listed in the accompanying table. (See opposite.) Bill Mapleson

• **Keywords in BASIC** – I have found that PRINT 'SHIFT F1' showed a lower case underline 'a'. From BASIC on pressing return to 'PRINT' the result I found a number that looked just like TIME. It was. SHIFT F2 gives HIMEM and SHIFT F3 = LOWMEM. No other Fkey gives a number, but they all act as quick entry keys for use in BASIC program writing within ARMB edit. They must be programmed with BASIC keyword token values.

I expect this is widely known but here is the list for completeness.

F.KEY:	1	2	3	4	5	6
CTRL	TIME	LOMEM	HIMEM	ABS	ACS	ADVAL
SHIFT	DIV	EOR	MOD	OR	ERROR	LINE

F.KEY:	7	8	9	10	11	12
CTRL	ASC	ASN	ATN	LOCAL	MODE	MOVE
SHIFT	OFF	STEP	SPC	CLG	CLS	DATA
CTRL+SHIFT				STOP	COLOUR	TRACE

Simon R.Anthony, Nottingham

• **Locating screen coordinates** – When writing wimp programs (out of desktop) it's often hard to plot things because you're not sure what the coordinates of the screen are. Using the program below, it is possible to do this.

```
10 MODE 12
20 VDU23;8202;0;0;0;0;
30 *POINTER
40 MOUSE x,y,z
50 REPEAT
60 PRINTTAB(0,0)x,y"      "
```

```
70 MOUSE x,y,z
80 UNTIL FALSE
```

I hope the program is of some use to wimp programmers. Duncan Burbidge

• **MSDOS installation on hard disc** – Here is a summary of the steps for getting an MSDOS partition installed onto a hard disc.

1. (This step applies only if you have on old PCEmulator, e.g. V1.20, and a V1.33 upgrade disc)

(a) Read 'ReadMe2' on the V1.33 disc.

(b) Run 'MakePC' on the V1.33 disc. (This copies the file !PC.Rom from the 1.20 disc to the 1.33 disc. Although the desktop displays this as a 'text' file, I reckon that in fact it is the emulator itself and that all the other files are concerned with preparing the Archimedes to run the Emulator.)

2. Read 'ReadMe' on V1.33 but don't take too much notice of it – it confused me a lot!

3. Examine the files !PC.GenBoot.!Config and !PC.GenBoot.!Modules. If you have more than 1M of RAM, it may be worth changing some of the 'Y's to 'N's in !Config. When I first tried it, without any changes, my screen went blank because my Taxan 795 monitor requires the VIDC enhancer and the VIDCmodes software installed in order to synchronize when not in modes 18-21. With a 4M machine, I decided to make all the responses 'N' and everything seemed OK.

4. If you have a SCSI hard disc (as I have), run !SCSIDisk. This renames !PC.SCSIRun2 to !PC.!Run2 and !PC.!Run2 to !PC.!ADSF[sic]Run2. That is, it makes !Run2 the file that defines where the MSDOS partition is to be placed – on a SCSI hard disc not on an ADFS one. !SCSIDisk then creates a file 'PC.Drive_C' on the SCSI disc of the size you request (1 to 32M). This file can be *TYPEd from the Archimedes command line – but don't do

List of available modes with Atomwide's VIDC enhancer switch on or off and VIDCmodes software with a Taxan 795 multi-sync colour monitor or standard resolution monochrome monitor.

			'VIDCmodes' module			
			Not installed		Installed	
Mode	Chars	Pixels	VIDC off	VIDC on	VIDC off	VIDC on
0–14	20–80 *25–32	160–640 *256	mono	–	795	[795][1]
15	80*32	640*256	mono	–	795	–
16,17	132*32,25	1056*256	mono	–	–	795
18–20	80*64	640*512	795	795[2]	795	795
21	80*64	640*512[3]	795	–	795	–
24	132*32	1056*256	mono	–	mono	–
25–27	80*50	640*480	795	[795][4]	795	[795][4]
28	80*50	640*480[3]	795	–	795	–
96–98	100*75	800*600	mono[5]	–	–	795
100–102	144*61	1152*486	mono[5]	–	–	795

[1]Only 2/3rds full height.

[2]The 80 columns use only 2/3rds full width.

[3]256-colour mode

[4]Lose either column 0 or column 79 and screen flickers in mode 27

[5]In mode 0

NOTE – Switching between modes sometimes requires adjustment to the height, width and position controls on the monitor.

it until everything is complete because its contents misled me! The screen then displays instructions for running two MSDOS commands: FDISK and HDINSTAL. It also displays the injunction 'Press ESC to stop; Press RETURN to continue'.

5. If you press <return>, the instructions are cleared from the screen; the PCEmulator is loaded and you are invited to put the MSDOS boot disk into 'Drive A' (Drive 0). Doing so, and pressing <return>, loads MSDOS which asks for date and time – but pressing <return> in response to each request supplies the information from the system clock. When the 'A>' prompt appears, you need to carry out the instructions that were recently wiped off the screen: Type 'FDISK', then '1' to create a DOS partition, then 'Y' to assign all of file Drive_C to DOS; then 'HDINSTAL' which formats the hard disc and transfers the MSDOS system files from the floppy MSDOS boot disc to the hard disc.

6. If you press ESC (at the 'ESC to stop, <return> to continue' injunction) and need to run !SCSIDisk again, beware that this will re-name the !Run2 files. I avoided this by 'REMming' the *rename statements in !SCSIDisk.!RunImage. (This is a BASIC program from which it would appear that the procedure for installing MSDOS on an ADFS hard disc would be the same without the complication of renaming the !Run2 files.)

7. Once MSDOS is safely on the hard disc, the !PC application can be transferred from the V1.33 disk to the PC directory on the hard disk.

8. One last complication for me was that when I typed 'HDINSTAL' I got the quaint message 'insert new diskette in drive C' and, on pressing <return>, 'drive not ready – format failure'. Eventually, after many hours and several phone calls, the explanation turned out to be that I have two external 5-1/4" drives and MSDOS was seeing the second of these as Drive C and the SCSI hard disc as Drive D. To avoid amending HDINSTAL (which is a simple batch file) I told RISC-OS that it had only two floppy drives (*CONFIGURE FLOPPIES 2, followed by <ctrl-break>) and all went smoothly. Subsequently I reconfigured to three floppies and now MSDOS wakes up with a 'D>' prompt ready to run from the hard disc. The most useful tool for finding out what MSDOS thinks it has is to type CHKDSK A:, CHKDSK B: etc.

9. Finally, in RISC-OS, **lock** the 'Drive_C' file. I'm astonished that this is not done by the PCEmulator programs. Without it, a careless click in RISC-OS might destroy all your MSDOS files! Bill Mapleson

• **Saving your configuration settings** – I recently needed to change the batteries in my Archimedes but this meant that I would lose the configuration settings stored in the CMOS RAM. I managed to solve the problem by writing two small programs that saved and then restored the CMOS RAM settings to and from a file.

```
10 REM *** CMOS reader ***
20 INPUT "Enter filename: "file$
30 file%=OPENOUT(filename$)
40 FOR byte%=0 TO 239
50 SYS "OS_Byte",161,byte% TO
                              ,,result%
60 BPUT#file%,result%
70 NEXT byte%
80 CLOSE#file%
90 END
```

```
10 REM *** CMOS restorer ***
20 INPUT "Enter filename: "file$
30 file%=OPENIN(filename$)
40 FOR byte%=0 TO 239
50 SYS "OS_Byte",162,byte%
                            ,BGET#file%
60 NEXT byte%
70 CLOSE#file%
80 END
```

Sham Gardner, Karlsruhe (Germany)

(The other way of doing it is to open the computer, switch the computer on, change the batteries, switch off and then put the computer back together again – but I dare not suggest that you should do that because someone might stick a screwdriver into the heavily protected p.s.u. and I'd get blamed – so I didn't suggest it, OK? Ed.)

• **Wimpslotting warning.** Always give the maximum amount of memory your program is going to use. Otherwise, the computer will eat up all the available memory and use it for the program and you can't get the memory back unless you quit the application! This happens in FormEd (All versions, I would assume). The FormEd !Run file contains the line:

```
WimpSlot -min 288k
```

Using !Edit, change this line to...

```
WimpSlot -min 288k -max 288k
```

The program will then run, using up less memory, meaning that both !FormEd and !Paint can run at the same time on a 1M machine. You have been warned. Duncan Burbidge

Comment Column

• **Archimedes' Achilles Heel** – Why does no-one else see that the Archimedes series of computers has very real limitations when running in DOS emulation mode? Am I the only person who feels cramped by the very obvious limitations imposed by the emulator?

One can only conclude that those who write about the virtues and strengths of the Archimedes never have to get a real job of work done on the machine.

Now, don't get me wrong. I am, and remain, a fan of the Archimedes. I put my money where my mouth is, running a 440 (serial number 15) with a multi-sync monitor and Epson LQ-400 printer.

At work, I use a number of computer systems ranging from an ICL 3960 to a Dec Vax 8530 to an IBM 55SZ. On occasion, I've even been let loose on £16,000 worth of Apple Macintosh with Aldus Pagemaker and a 19" Radius monochrome screen (and it won't change font sizes on the fly despite the awesome cost!)

The problem is in bringing work home that can be downloaded onto DOS discs at work and then attempting to load those discs into the 440.

Loading from DOS discs is painfully slow. Then having only a CGA display is a disaster!! My work involves extensive use of spreadsheets. Being limited to a display 80 characters wide is distinctly cramping.

But the real cramper is displaying graphs in DOS. EGA is the minimum necessary and VGA would be a benefit.

Then there is access to memory: 640k is all very well, but for large spreadsheets access to 2 or more megabytes would help. My machine has that memory available so why can't I use it? *(You can! See the article on page 19. Ed.)*

I have toyed with upgrading to a 540. Trouble is, at the moment I can buy a 368 processor and VGA display and 80M or 100M drive and 1M or 2M of memory for less than the upgrade. If I do upgrade, I still can't use the machine for any really USEFUL spreadsheet work. And, with the recession out there in the real world, prices of IBM compatibles continue to plummet.

Why, therefore, should my next machine be an Archimedes? Will someone please give me a convincing reason? Michael Green

• **RISC-OS compatability** – Over the past couple of years software developers have been getting to grips with RISC-OS and it capabilities. During this time, the software that has been produced hasn't always made the best use of RISC-OS. This has resulted in a plethora of terms such as RISC-OS compatible, RISCWARE, desktop-friendly, WIMP based, etc. Often the terms have been used differently by the various software developers and so it is difficult to know exactly what they mean. Misinterpreting these terms could result in a rather expensive mistake.

For example, one reader bought Minerva's MultiStore only to find that another 'RISC-OS compatible' application (one of Silicon Vision's programs but I can't remember which one) had the habit of closing ALL the files that were currently open. This meant that MultiStore couldn't access its files properly and so the applications couldn't be used together (which he particularly wanted to do).

Acorn are currently in the process of producing a directory of third party products for the Education market and are asking third parties to categorise their software and hardware. Here are the categories that Acorn have put forward. If you want to run expensive applications in the desktop it is probably worth while asking the producer exactly which category their software falls into.

RISC-OS Compliant – applications which run in the desktop and closely follow the RISC-OS guidelines.

RISC-OS Compatible – applications which can be loaded from the desktop and have a quit option which returns the user to the desktop with no change to his machine.

RISC-OS Coexistant – applications which will run in a machine fitted with RISC-OS but which fit neither of the above categories. Adrian Look

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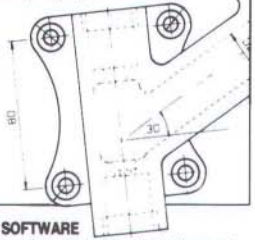

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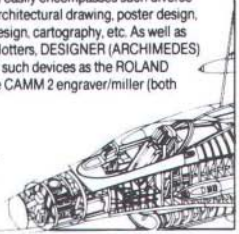

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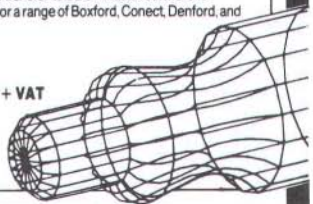

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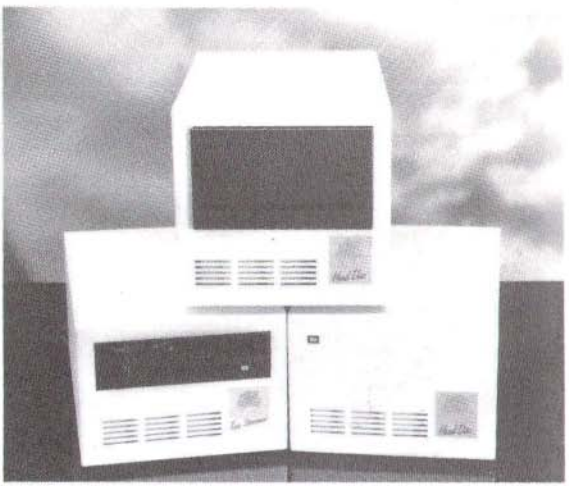

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SCSI Column

Paul Beverley

New cheaper 20M drive for A3000 owners

Oak have now produced a 20M SCSI drive for the A3000 to catch the home user end of the market. The new 20M drives are 40 millisecond average access time but, being on the Oak 16bit SCSI interface instead of the slower 8-bit interfaces, they are capable of speeds of approximately 600kbytes/second (faster than most 20M ST506 drives). The pricing is £349 +VAT or £390 including VAT and carriage from Archive. This is an external drive in metal case with power supply and fan, just the same as the original 20M drives at £535 + VAT. So how have Oak managed to drop the price so much? Well, they were not selling many 20M drives, so the price was relatively high when compared to the 45M drives so for the extra few pounds most people felt that it was worth stretching to get more than double the capacity. So Oak have bought the 20M drives in very large quantity which therefore brings the price down dramatically and also, they have used slightly slower drives but not enough to make a noticeable difference. Note too that these are still auto-parking drives.

New software for Oak drives

Oak Computers have maintained the superiority of their SCSI products by adding extra features to their SCSI software.

- The new software allows drives to be partitioned into logical drives. In other words, each physical disc can be accessed as one or more drives on the icon bar. There are two main advantages of this. Firstly, this will allow the use of drives bigger than the maximum 512 Mbytes that RISC-OS can cope with as one drive. The currently available 640 Mbyte drives can therefore now be fully used, and you could use up to 2 Gbyte drives. Secondly, each logical drive can be write protected. This means that, say in a school situation, pupils could have access to applications on a write protected drive and use a separate drive on which to store their own work.
- The drive icons on the icon bar shows the disc names and not just SCSI4, SCSI5 etc – this is particularly useful with removable drives as you will be able to see at a glance which disc is in the drive.
- There are a number of other features which improve the use with removable drives (including magneto-optical drives). For example, the drive eject button can be disabled and magneto-optical discs can be ejected from the desktop.
- There is now a configurable delay which allows a pre-defined delay before any attempt is made to mount the drive when booting. This gets around the problem with very old SCSI drives, some of which misbehave if accessed whilst they are spinning up.
- The SCSIForm program has been enhanced to take account of all these extra features.

The improved software (a ROM plus a disc) is available for an upgrade charge of £10 +VAT from Oak Computers or £11 through Archive.

New Oak Elite range of SCSI drives

Oak Computers have just announced a new range of SCSI drives – 40M, 80M, 100M and 200M internal and the same plus 300M and 640M external. These drives are "so reliable that they come with a full 2-year guarantee". The external drives come with an "almost silent" Papst fan. (What? Haven't you heard of a Papst fan? – No, neither had I!) The prices are quite a bit higher than the standard range drives, but there are applications where the extra reliability is worth paying for. We will not be holding these drives in stock but will be able to get them to order. The prices are given in the Price List.

TechnoSCSI's

Technomatic have now entered the SCSI arena. We have recently got hold of one of their 8-bit interfaces for assessment. All we have had time to do is plug it in and see if it works. First impressions are that it is about as fast as the other 8-bit interfaces and that the software is similar to Lingenuity's in terms of ease of setting up but not as good as Oak's. The 'manual' looks sparse to say the least – four pages of A4. It has a Centronics type connector (like the Acorn SCSI). It works with the MR45 removable drives as well as standard SCSI hard drives. I will try to give more details next month.

Oak bias?

I have had some criticism that I am biassed towards Oak and I have to confess that it is true but it is based,

not on prejudice, but on a careful assessment of the facts over a long period of time. I think Oak's products, though slightly on the expensive side, have always been, and still are, the best SCSI devices on the market. Also, I think that their customer liaison has always been the best of the companies trading in SCSI equipment. This is based on my own experience plus reports from subscribers. Yes, I can cite occasions where Oak have failed to give 100% service and occasions where Lingenuity and other companies have given excellent service but, overall, Oak comes out on top in my view. However, as each new product comes available, I will try to get hold of a sample and assess it. A

Help!!!

• **Clares clashes with EMR** – I have EMR's MIDI interface board with version 3.14 of the software. It works with EMR's own Studio 24 plus (version 2) and my Yamaha PSS 790 keyboard. However, Clares' Armadeus refuses to recognise the board's presence and Rhapsody simply will not co-operate with it. For example, I can load a piece of music into Rhapsody but it will only play on the internal speaker. I have tried to assign the MIDI to a set channel both through the software and on the keyboard but all I get is a 'buffer full' error. When I phoned the respective companies, Clares' technical department blamed EMR saying that the MIDI software does not follow Acorn's standard calls but EMR says that they have. To say the least I am a little perplexed. Can anybody help? Mr D Hill, 120 Bolehill Road, Walkley, Sheffield 6, Yorkshire.

• **OCR** – Does anyone know of any OCR software that works with any of the available scanners? Alexander Bisset (and various others). A

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Expanded Memory for PC Emulator

David Wilkins

This article describes how it is possible to obtain so-called 'expanded memory' when running the Acorn PC Emulator on an Archimedes with at least 2M of RAM and/or a hard disc.

Expanded memory

The Intel 8088 (used in the original IBM PC), 8086, 80188 (emulated by the Acorn PC emulator) and 10186 processors all have a limit of 1M of RAM which they can address directly. This memory is divided into 64k segments and a memory address is specified by using both a segment register and an offset register, as 16 bit registers are used. In the design of the IBM PC and all compatibles and emulators, the first ten segments (i.e. 640k) are allocated to RAM and the top six segments to hardware devices such as the video graphics card which has its own RAM. In most cases, much of the address range between 640k and 1024k is unused.

When the first IBM PC was launched, the base model had 64k RAM and no discs! 'Business' versions had 128k or 256k. However, as time went by, programs became larger and inevitably even the maximum 640k became too small for large spreadsheets. Lotus (authors of Lotus 1-2-3), Intel (the processor manufacturer) and Microsoft (authors of PC-DOS and MS-DOS) got together and agreed a method of providing additional memory. This memory is referred to as LIM (after the initials of its sponsors) expanded or EMS (Expanded Memory Specification) memory.

The expanded memory is normally provided on expansion cards, the card typically having from 512k to 8M of RAM plus support chips. The RAM is divided up into 64k chunks, referred to as pages, and one or more of these pages is mapped by hardware into unused segments, or 'page frames', in the area 640k to 1024k in the address map of the computer. The 'pages' of expanded memory are paged in and out of the computer's memory map as needed by the application program, by making calls to the operating software for the expanded memory.

More recently, expanded memory emulators have appeared. These use a hard disc file, or 'extended' memory on 286/386/486 computers, as a substitute for hardware expanded memory. (Extended memory is memory above memory address 1M in machines with Intel 286/386/486 processors, which can address more than 1M). These emulators are generally rather slower than 'real' hardware expanded memory, especially when hard disc files are used.

The method used here is based on one of the expanded memory emulators, and using a ramdisc (Archimedes RAMFS) or hard disc file. If you have 2M or more of RAM in your Archimedes, the ramdisc method is 5 to 10 times as fast, depending on the speed of your hard disc. With an ARM3, the ramdisc method would be even faster.

The expanded memory software which I used is "AboveDisc", which costs about £80 to £100 depending on the source. There is other similar software available which is no doubt just as good.

The method using a hard disc file will be described first and then how to transfer this to a ramdisc.

Hard disc method

The AboveDisc software comprises two files, VEM.SYS (the device driver) and ABVDISC.COM, and an installation program. Having started up the PC emulator, the installation comprises copying the two files onto the hard disc and adding a line to both the CONFIG.SYS and AUTOEXEC.BAT files. The line added to the CONFIG.SYS file:

```
DEVICE = VEM.SYS /C: 64
```

loads the device driver, tells it to use drive C: for the swap file and that the expanded memory should comprise 64 pages of 16k (=1M, assuming that is how much you want). The line added to the AUTOEXEC.BAT file:

```
ABVDISC
```

runs the ABVDISC.COM program and causes the swap file to be created and activated.

The AboveDisc software takes up about 100k of main memory, including its working space, and so leaves about 500k free for applications. It also obviously creates a file just over 1M in size on the PC partition of the hard disc, and so you need this amount free on your PC partition.

The expanded memory works with all the (limited) software I have tried it with, including Lotus 1-2-3 and SuperCalc.

It should be noted that expanded memory is slower that 'main' DOS memory and, for example, spreadsheets take rather longer to recalculate. Disc-based emulation of expanded memory is even slower but not unusably so. Archimedes hard discs are generally much faster that those in PC compatibles: Norton Utilities gives my Oak 200M SCSI drive a rating of 6.5 compared with an IBM PC XT. A PC partition on an Archimedes RAMFS ramdisc is much faster still, with a rating of 39.1!

Using an Archimedes ramdisc

To get the extra speed of the Archimedes ramdisc, a second PC partition is needed (i.e. Drive_D) located on the ram disc. The following method assumes that you are using the PC emulator version 1.33 or later.

The first step is to decide how much expanded memory you want (or will fit on your machine). For 1M of expanded memory, you need a swap file of 1M. Allowing room for the DOS directory, etc, a PC partition of 1.1M is needed. Alternatively, a PC partition of 1M would allow about 960k of expanded memory swap file. The Archimedes ramdisc size needs to be larger than the PC partition to allow room for the RAMFS root directory, etc and, overall, the ramdisc needs to be about 128k larger than the expanded memory required. The maximum size of expanded memory that can be obtained is about 1.5M less than the RAM in the Archimedes, i.e. 512k expanded memory in a 2M machine (e.g. A420) or 2.5M expanded memory in a 4M machine. To get the maximum size expanded memory, you may have to manually kill off any applications or desk accessories before starting the PC emulator, to provide room for the ramdisc.

As supplied, the programs !ADFSDisk/!SCSIDisk, which create PC 'drives', can only create drives of multiples of 1M in size. The modifications required to allow 34k increments (the smallest possible) are to the file !SCSIDisk.!RunImage (or !ADFSDisk.!RunImage, the line numbers are the same) and are:

```
370 REPEAT Size =FNAsk("Enter
        required partition size in
        Mbytes (between 1 and 32), or
        press RETURN for default size
                          (10Mb)",10)
380 UNTIL Size >= 1 AND Size <= 32
560 Size%=INT(Size*30)*4*512*17
970 LOCAL X,Y,reply$,value
1060 value =Default%
1080 value =INT(EVAL(reply$)*30)/
                                30
1100 PRINT TAB(X,Y);value;SPC5
1110 = value
```

Before running !SCSIDisk or !ADFSDisk, don't forget to temporarily rename your 'Drive_C' file (assuming you have one) to say 'Drive_C_o', as !SCSIDisk/!ADFSDisk creates a new Drive_C file. Run the !SCSIDisk or !ADFSDisk program and create a new PC partition of your chosen size (e.g. 1.1M to get 1M expanded memory). Then, rename this new file from 'Drive_C' to 'Drive_D', and rename 'Drive_C_o' back to 'Drive_C'. You now have your original PC partition ('Drive_C'), and a new one ('Drive_D') just for the swap file for the expanded memory.

For the finished product, the 'Drive_D' file will be copied onto the RAMFS when the PC emulator is started up but for now it should be left where it is whilst the new DOS 'disc' is formatted and the swap file created, since anything on the RAMFS is erased when you leave the PC emulator.

The next stage is to tell the PC emulator about your new 'Drive_D' file, by updating the last line in the !Run2 file in the !PC application, to:

```
/<PCe$Dir>.!RunImage <PCe$Dir>.ROM
                adfs::4.$.PC.Drive_C
                adfs::4.$.PC.Drive_D
```

if your hard disc is ADFS or

```
/<PCe$Dir>.!RunImage <PCe$Dir>.ROM
                SCSI::4.$.PC.Drive_C
                SCSI::4.$.PC.Drive_D
```

if your hard disc is SCSI. Alternatively, if you keep the 'Drive_C' and 'Drive_D' files in the PC emulator directory (!PC), it can be amended to:

```
/<PCe$Dir>.!RunImage <PCe$Dir>.ROM
                    <PCe$Dir>.Drive_C
                    <PCe$Dir>.Drive_D
```

Now start up the PC emulator and invoke the FDISK utility (by typing FDISK), either from the hard disc (if it is there) or from the working copy of your MSDOS system floppy. Having started FDISK, choose option 5 (Select Next Fixed Disk Drive) and the message near the top of the screen will change to "Current Fixed Disk Drive : 2". Next, select option 1 (Create DOS partition) and answer 'y' to the the question "Do you wish to use the entire fixed disk for DOS?". FDISK will create the partition and then restart the system after a prompt (Note: you do not need to put a DOS floppy in drive A as you should already have a DOS hard disc C).

The next stage is to format the new drive D, by typing:

```
FORMAT D:
```

and then 'y' to the question "Proceed with Format (y/n)?". When the format is complete, it will report the size of the new drive, which will be 1122304 bytes if you made a 1.1M 'Drive_D'.

Now add the line:

```
device = \ABVDISC\VEM.SYS /D: 64
```

to your config.sys file, using EDLIN or another editor, assuming that the AboveDisc files VEM.SYS and ADVDISC.COM are in directory C:\ABVDISC. The 64 tells VEM.SYS you want a 64 x 16k = 1024k swap file and should be amended if you want a different size. Add the line:

```
C:\ABVDISC\ABVDISC
```

to your autoexec.bat file, again assuming you have put the AboveDisc files in directory C:\ABVDISC.

Re-Boot DOS (with Ctrl-Alt-Delete) and if all goes well various extra messages will appear during the booting reporting the installation of the AboveDisc software and the creation and initialisation of the swap file. Running Norton's System Information (SI) or equivalent should show the presence of the expanded memory.

Now we come to the last stage of the process, that of transferring Drive_D to sit on a ramdisc. This requires amendments to six files within the !PC application.

File '!PC.!RUN': add the following lines after the three line starting with "|":

```
RMEnsure MemAlloc 0.11 RMLoad
                System:Modules.MemAlloc
RMEnsure MemAlloc 0.11 Error
      Module 'MemAlloc' is missing
RAMFSSize 1152k
copy <Obey$Dir>.Drive_D
                RAM::0.$.Drive_D ~C
```

These lines create the ramdisc and copy the file 'Drive_D' into it. The figure of 1152k is for 1M of expanded memory and should be adjusted, if necessary, for other sizes of expanded memory.

File '!PC.!RUN2': alter the last line to:

```
/<PCe$Dir>.!RunImage <PCe$Dir>.ROM
                <PCe$Dir>.Drive_C
                 RAM::0.$.Drive_D
```

This tells the PC emulator to look on the ramdisc for 'Drive_D'.

File '!PC.GenBoot.!Config': set the flags for RMClear (line 10) and for RMTidy (line 12) to 'N', to stop the emulator start-up program from performing an RMClear or RMTidy, either of which would wipe the contents of the ramdisc.

File '!PC.GenBoot.!Modules': REM out (i.e. insert a '|' character at the beginning of the line) the modules 'FileCore%RAM' and 'RamFS', to tell the emulator start-up program not to RMKill these two modules which are needed to operate the ramdisc.

File '!PC.GenBoot.!Run3': REM out (i.e. insert a '|' character at the beginning of the line) the line containing 'RAMFSSize 0', to stop the emulator start-up program from trying to change the size of the ramdisc.

File '!PC.GenBoot.!RunImage'. Here comes the tricky bit. This file, amongst other things, normally empties the ramdisc which is just what we don't want to happen. The file is actually a BASIC program with a machine-code header, which makes it look like a complete machine-code program. Near the start of the BASIC program, there is a line which calls PROCramfs and it is this procedure which empties the ramdisc. The answer lies in preventing the call to PROCramfs by 'poking' the code for 'REM' into the space occupied by the code for 'PROC'. To do this, first load the file into Edit and advance the cursor to line 4, character 475 – press <F5> and a box pops up to tell you which line and character you are at. In front of the cursor should be "rramfs". Delete the "r" character (ASCII 242, the

code for 'PROC') and insert the character "t" (ASCII 244, the code for 'REM'). The character "t" can be obtained by holding down the 'ALT' key and typing <2> <4> <4> on the numeric keypad, then releasing the 'ALT' key (assuming the module 'InternationalKeyboard' is not disabled in your machine). Then, save the modified file with its original filename.

All is now ready for you to start up the PC emulator by double clicking on !PC, and check that the expanded memory is present. A

Stopress versus !VDE

Tony Colombat

At a time when Hypermedia packages are popular, it may seem old-fashioned to review a Videotex package. Videotex is still a powerful means of providing information and, whereas Hypermedia packages are extremely hungry of discs and computer memory, Videotex pages are 1k in size. Both packages reviewed create pages which may be displayed not only on Archimedes but also on BBC B and Masters, useful for Education. In both cases, this will involve the cost of additional software.

Well, what have these packages to offer above the old BBC B Videotex Editors?

Stopress

Stopress is both a Viewdata "Viewer" and "Editor", based on a system of saving frames within a preset database structure and a maximum of 255 frames. It runs like a BBC B viewdata system in that, once the application has been chosen, it takes over the Archimedes and works through a Menu system of commands, without using the mouse.

Stopress is easy to use and fkeys add control commands of colour or special effects. There are many extra features which I have not seen on a Beeb videotex, including a simple but useful wordprocessor; a powerful copy facility for text and graphics; marked areas can be saved to disc for repeated use as a macro in other pages; double height text is easily achieved and big letters (triple size) in six different fonts are available. The graphics facilities were not so extensive – lines and circles were easy to produce and fill patterns were available but drawing shapes was more difficult as the cursor moved far too quickly for detailed control. Other features permitted a column of control codes to be entered quickly, and a patch facility to swap a set of control codes.

A manager menu provides a means of copying, importing and printing frames, as well as permitting the establishment of a new database. The maximum number of frames must be determined from the beginning and, once established, the organisation of the database could be adjusted, through the menu.

Stopress comes with a comprehensive 64-page manual which not only describes the software but also explains how videotex works and provides a jargon page for those unfamiliar with the terminology. Two datafiles are supplied, one of which is a very good tutorial to be used with the manual.

!VDE

!VDE was a preview copy and not all the planned features were implemented. The package has been conceived by an Archimedes' user and retains as far as possible a RISC-OS philosophy. On choosing the package, two icons are installed on the icon bar. On the left is the directory where frames are to be stored and on the right is the editor.

The editor takes over control of the Archimedes, changing to Mode 7. The facilities offered by !VDE are much the same as Stopress but the mouse is utilised to operate the cursor and five on-screen menus for colours and special effects replace the fkeys. This system is far more natural to the Archimedes' user and, as graphics are achieved with the mouse, detailed control is easier than Stopress.

Database management is achieved in the desktop, for once editing is complete, the user chooses the "Desk" option and returns to the Archimedes desktop, where frames can be saved, loaded, imported, copied or converted to sprites. All the work of linking frames, etc takes place from the desktop and is easier to achieve or alter than Stopress.

The manual I received was limited and there were no datafiles but I am assured that the final version will have a comprehensive manual and three substantial databases including a tutorial on !VDE. Also, the !VDE I received was only an editor and not a viewer but the release version will have viewer and carousel features.

Which to choose?

Well it is really a matter of opinion. Stopress is a comprehensive package which those upgrading from Beebs will find easy to use, especially if they have met the software before on a Beeb. I do not like applications which take over my machine, especially when they use long winded menu systems. I far preferred the use of the mouse and desktop philosophy of !VDE, with its greater flexibility in being able to organise and adjust a database.

Stopress Extra!!

I have received a reply from the Advisory Unit over some comments I made with regard to "Stopress". The graphics cursor speed criticism has been fixed and so drawing shapes is easier.

It was pointed out that the Archimedes version of Stopress works in the same way as that for the BBC "B" and Nimbus so that children could use the package on any of the machines using a consistent interface.

"Stopress" – The Advisory Unit, £30 + VAT (Network)

"!VDE" – XOB £28 + VAT (Network) A

Matters Arising

• **Agenda Users** – In the August Archive, my Agenda review was published. The monthly disc held my cobbled-together Agenda up-loader program, Agenda to Archimedes. This runs in BASIC with not a multi-tasking wimp in sight. Problem: can I up load the Agenda now with the WP already running? Yes, just. Use the F12 command line to start BASIC, run my new program – which now makes a control code cleaned up version of Agenda files on a RAM disc only – and ESCAPE back to the still running desktop applications once the Agenda has finished sending its text. If things don't work first time, call up the Task Manager and see what you can squeeze for more memory, then have another go. If things get very tight then the RMA can run out of space and lock you out completely, caught in a warning window. However you can't have everything – until I learn how to use Wimps! You can always shut down the WP but that is not as much fun. If you inadvertently QUIT BASIC to the operating system as long as the memory has not been corrupted by any large user, typing *DES. will bring back all your windows as you last saw them.

I am sure I read somewhere about a small add-on to First Word Plus release 2 that would replace the lost automatic 'BAK' directory saving of an old file when a new one of the same name is saved in the 'DOC' directory. I have yet to sort my way though the mysteries of programming windows and such so – if I am wrong about this task having been achieved by someone else – is anyone interested?

In several places I have come across programs for cleaning up text that won't format because they are filled with Hard Spaces. The FWP2 manual shows how to correct this. Just search and replace all such spaces by using the REPLACE facility, 'search' for a normal space-bar-space and it will find all the hard spaces as well and replace them with soft spaces. Simon R.Anthony, Nottingham

• **D.I.Y. Memory upgrades** – One or two readers have sent in comments about the instructions for D.I.Y. A310 memory upgrades that we were sent by Willi Langhans which we were sending out photocopies of to those who asked. BASICally, they were warning people to think twice before trying it because it is not all that easy to do. Also, people were confused about the amount of memory chips needed. The upgrade leaves the internal ram unused so that to upgrade the computer to 2M needs 2M of ram, not just 1M. (This ram is available through Archive at £70 per Mbyte.)

• **Fatal Error (type 3)** – The !Draw1.5 application on Shareware 34 will report this error if the Floating Point Emulator module has not been loaded first. A copy of the module, called 'FPEmulator', can be found in the 'modules' directory of Applications Disc Two.

• **Laser Printer Problems?** One subscriber rang in to tell us that some companies say that the guarantee on their laser printers is invalidated if the printer is connected to a computer through a mechanical printer switch. Presumably, there is a possibility that the switches may cause transients that would damage the printer. So, if you use a switch, check the conditions on the warranty. A

Music Column

Stewart Watson

At last, the music software support for the Archimedes is beginning to come on stream at a reasonable rate. Until recently Electro Music Research had things all their own way and although they have pressed ahead with program development, a bit of competition can hardly do the end user any damage and in the last couple of months, packages from three new sources have become available.

Inspiration

At the professional end of the market, Ampsound's long awaited sequencer, Inspiration, has been released, price £299. I hope to be able to review this soon. *(I gather from other sources that it is still not exactly bug-free. Ed.)* This will provide competition for Studio 24 version 2 from EMR and hopefully we will begin to see more pro-standard programs becoming available.

Rhapsody

Clares have released Rhapsody, a music notation package, which I think is best viewed as an upgraded Maestro.

Manual

I received my review copy just before going on holiday which meant I had plenty time to read the manual before I actually used the program, the reverse of my usual habit. The manual is well laid out and, after encouraging you to make a back up before you start, there is a section for those who don't like reading manuals. All the information is sensibly presented and there is a thorough index at the back of the seventy page manual.

Musician's word processor

All the usual editing facilities like cut and paste, etc are present and, as you can have up to five scores open at once, you can cut and paste between them. There is a full range of notes and accidentals, and a text option for adding lyrics.

Printing

The options for printing are good – you can select portrait or landscape and a scale factor of 50% to 150%. I was, however, slightly disappointed with the quality of print out. I tried both an Epson FX80 and a Panasonic KXP-1124 and the results though acceptable were definitely chunky on both printers.

Real time input

There is an option to input in real time via MIDI and though this works extremely well, though there is no count in, so you have to delete the blank bars that are entered when you are getting from the computer to your keyboard, which is a bit of a nuisance.

Compatibility

Playing files via MIDI works well, I am using an EMR MIDI 2 podule and there is absolutely no problem. Maestro files can be loaded straight into Rhapsody and played in this way too.

At £49.95 from Clares Micro Supplies, it is certainly good value for money, though a little more time spent on improving real time input facilities, and better definition of notes for printout would have moved the package from being very good to being excellent. (See Jonathan Puttock's excellent review on page 29 for more details.)

Hands on Midi software

An interesting new way of getting to grips with a piece of music comes from Hands On Midi Software. They provide pieces of music in MIDI standard song file format ready to load and play using Studio 24 and a Roland CM64 sound module but once the pieces are loaded, the user can reconfigure the parts for whatever MIDI equipment they have available.

The disks cost £19.95 each, for which you get either 4 chart hits, 3 TV or film themes or 2 classical pieces. Further information: Hands On Midi Software, 14 Lodge Road, Bedhampton, Havant, Hants. PO9 3LL. Tel 0705 452682.

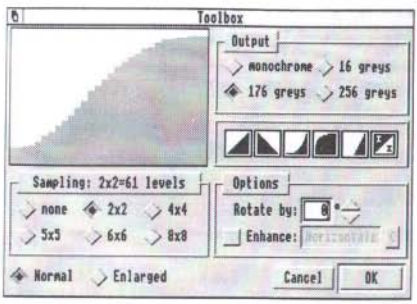
Electro Music Research

EMR also have a number of new products in the pipeline and their scheme of providing a network of Computer Music Learning Centres throughout the country seems to be moving forward. The idea is that each region will have a local 'expert', who will receive support from EMR and will in turn supply help to Archimedes users in their locality and so provide a cascade of information. A

SCAN LIGHT Plus

The latest generation Scan-Light Plus software provides a new easy to use and very powerful interface to the range of Scan-Light scanners and represents the most advanced software available for monochrome scanners on the Archimedes.

The main features of Scan-Light Plus centre around the scan toolbox. This controls the altered image view and allows the original scaled image to be sampled or anti-aliased in numerous different ways. This feature allows monochrome dithered scans to be turned into full grey-level sprites, ideal for incorporation into DTP or other programs. For example 4 by 4 sampling provides 16 grey-level images, while 8 by 8 sampling will turn an image into a 64 grey-level. The grey-map allows precise and accurate control over these grey-levels. The grey-map cannot only lighten or darken the image but also invert it or, more usefully, compensate for any non-linearities in the original picture or the printer. The grey map provides direct control over the gamma correction curve. The toolbox also controls the number of greys in the output file - it's even possible to typeset images with 176 grey-levels suitable for photographic quality results.



Scan-Light toolbox.

Features Include:

- Totally RISC OS compatible supporting in-memory transfer.
- Preview during scan to indicate progress.
- Two views of scanned image, original and altered.
- 61 grey-level screen display.
- Horizontal and vertical image flip.
- Prints either original or altered image, any scale, upright or sideways.
- Region select and crop to any rectangular portion of image.
- Original or altered image may be scaled by any amount.
- Original or altered sprite save.
- Sprite load facilities.
- A variety of altered image options;

- 6 sampling options from 1 by 1 to 8 by 8 sampling.

- Full control over brightness and contrast.

- Full grey-map control.

- Non-distorting image rotation in steps of one degree.

- Image rotation 500 times faster than !Paint.

- Additional image enhancement options such as edge detection.

All existing Scan-Light owners can obtain free upgrades of software.

Details subject to change without notice.

Scan-Light Junior A3000	£189.00 + VAT
Scan-light Junior	£189.00 + VAT
Scan-Light II A4	£399.00 + VAT
(Optional sheet feeder for A4 scanner)	£100.00 + VAT

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Rhapsody

Jonathan Puttock

After reading the glossy advertisements for Rhapsody, I found myself still uncertain about what sort of program it is. Fortunately, the manual is much clearer. "Rhapsody is to a musical score what a word processor is to a book. It will enable you to enter a musical score onto other scores and finally to print it out on your printer in a variety of scales and formats." Or to put it in a way which will be more meaningful for most Archimedes users, Rhapsody is basically similar to Maestro, using musical notation and allowing playback via internal voices or a MIDI interface, but with the addition of tempo and volume changes, triplets, printers and much more.

When you open a Rhapsody window with an empty score, a single stave initially appears. The main menu, accessible from this window, has ten options: **Score**, **Stave** and **Block**, which allow a variety of operations on the whole score, a single stave or a marked block; **Goto**, **Play from** and **Options**, which relate to playback, **Capture** and **Transcribe** (see below); **Display**, which allows the size of the display to be changed, and **Show panels**.

Entering music onto the stave

To obtain symbols to put onto the stave, this last item must be selected. Two small windows then appear, Panel-1 and Panel-2. Panel-1 is the most important; the bottom two rows of icons on this can show anything that needs to be inserted into the stave. Clicking on one of these selects it; further clicks cycle round the various possibilities, e.g. from hemi-demi-semi-quaver to breve in the notes icon. The other icons cover rests, accidentals, dots, ties and triplets, barlines, trills, clefs, key signatures, time signatures, tempo, volume and miscellaneous items such as block marker. In addition, clicking on one of the four icons at the top of the panel causes the selected item to be inserted at, before or after the cursor or to be deleted. The cursor can be placed on the stave with the mouse, or it can be moved around the score by clicking on a wide variety of arrow icons on panel-2.

Nearly all the mouse operations are duplicated by keystrokes on the computer keyboard; some 80 equivalents are defined. This is very convenient, as I found note-entry this way was quicker than continually moving the mouse around the screen.

Music from midi

The other way to enter notes is by "capture" from a MIDI keyboard. If capture is selected, Rhapsody plays the beat, or the existing notes in the score, and records what is played on the keyboard. There follows a 'transcribe' step in which the notes are quantised (pulled to the nearest quaver, say) and placed on the stave at the cursor location. This is the big difference from a sequencer. The normal approach with Rhapsody is to play the notes, keeping in strict time, rather than recording a performance. Expression, i.e. dynamics and tempo changes, are added afterwards. However, expressive results can be achieved in this way and there are some good examples provided with the program. For example, the Gollywog's Cakewalk from Debussy's "Children's Corner" is full of volume and tempo changes. The disc includes 19 example scores, ranging from Bach to the theme from "Fame" – over an hour of music in all.

Adding expression

Volume can be changed in three ways. Conventional dynamic markings from ppp to fff can be placed by each stave and are acted upon. In addition, a master volume can be changed at any point or gradually over any number of beats. This is shown in red at the top of the screen but does not appear on the printed score. A crescendo or diminuendo cannot be applied individually to one stave. In addition, on the stave menu four overall levels can be set from "silent" to "loud"; this is useful for temporary muting of one part or boosting a quiet voice on the synthesiser.

Tempo is changed in the same way as master volume, allowing sudden changes or accelerando or ritardando.

Editing

Rhapsody includes facilities to mark a block on one or more staves and then perform operations such as copy or delete. Five scores can be open at one time, so it is possible to use one as a notepad for repeated sections of music, copying and transposing as required.

Other facilities provided include a wide variety of trills, turns or grace notes (but not starting before the beat). The length of the staccato and marcato notes can be varied. Piano pedal markings can be inserted and are sent correctly to a MIDI instrument. Text can be placed anywhere and, if required, the notes will be autospaced to keep in step. Beams (the lines joining groups of quavers, etc) are placed automatically (but can be changed by the user). Maestro files are imported without difficulty, MIDI-format files can be read and written.

Printing the music

Once the music has been entered and checked, by eye and by ear, it can be printed. Printing is initiated by choosing the **Format** option from the **Score** submenu to print the whole score, or from the **Stave** submenu to print one part. Once the user has selected portrait or landscape orientation and the required scale, then the layout is previewed in a new window. I liked the ability to rearrange the layout at this stage. Clicking menu on any line and selecting remove bar moves the last bar of that line to the following line. The remaining bars in that line are expanded to fill the line, and later lines are reformatted. By repeating this process as needed, it is possible to avoid splitting tied notes across lines and to remove difficult page turns. Very acceptable results are obtained even from my cheap 9-pin dot-matrix printer, and output from a laser printer is of high-quality and readable even at **miniature score** scale. *(See below for samples of output on 24-pin and laser printer. Ed.)*

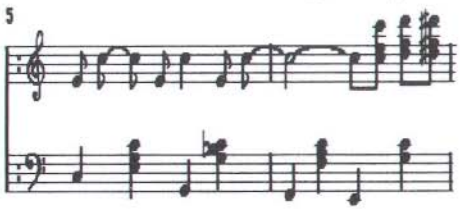
There are only a few aspects of conventional music notation which are not implemented. Crescendo and diminuendo marks ("hairpins") are not there. Although ties are used in Maestro, slurs/phrasing marks are not. This leads to the one significant non-standard feature of the notation – triplets have to be marked with a "3" over each note. Apart from that there is not much else that is missing. Da capo and similar markings would be useful. Also "8ve" octave markings and pause marks are not available.

I could only find one apparent bug in the program. When using first- and second-time bars, if the repeated section does not begin on a barline, an extra silent bar is inserted on playback. I found I could avoid this by removing the second-time marker and inserting "2nd" as text.

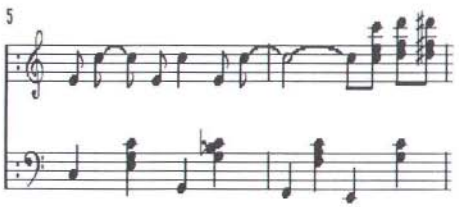
What more do you want?

With such a wealth of features at a reasonable price, it seems rather greedy to ask for more but there are a few things I would like to see. The program is recommended as a tireless accompanist for instrumentalists but there are not enough variations of slower-than-normal playback to be really useful (only 50% and 75% of normal). Given my minimal (musical) keyboard skills, I had some difficulty with capture even at slow speed. So I would prefer to enter long sequences of notes from the MIDI keyboard without having to play them in time, specifying note length from the keyboard. I would like to be able to increase the space between the staves to make more room for words. Finally, I found it tedious that, although I could change the MIDI (or Archimedes) channel at any point for any stave, I could not assign the MIDI instrument's voices to channels within Rhapsody (i.e. MIDI_TxProgramChange). I had to do that with a separate BASIC program.

Rhapsody comes on a single disk, not copy-protected, accompanied by an adequate 70-page manual. I would summarise it as "(Almost) everything you always wanted from Maestro including some things you would not have dared to ask for". It will not replace a sequencer for keyboard players who want the full facilities such software can offer but as a music notation and playback program it produces some excellent results. At £46 through Archive, I am sure that Clares have a hit on their hands. A

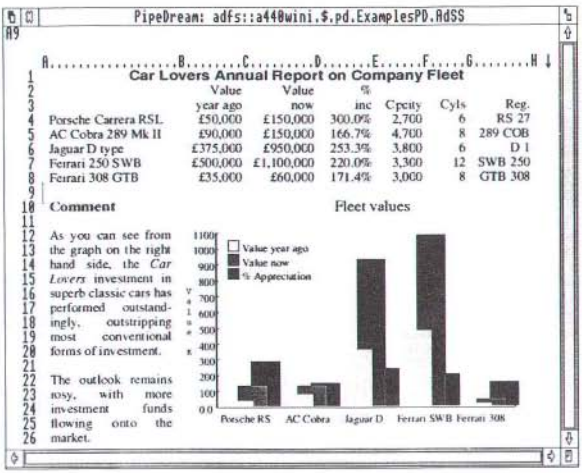


24-pin printer output



Laser printer output

PIPEDREAM 3



PipeDream 3 breaks down the barriers between word processor, spreadsheet and database. You can include numerical tables in your letters and reports, add paragraphs to your spreadsheets, and perform calculations within your databases.

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- Z88 filing system
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All trademarks acknowledged. The chart in the screen shown above was produced by sending numbers from PipeDream 3 to Lingenuity's Presenter 2 and then loading the resulting graph back into PipeDream 3.

Colton Software, Broadway House, 149-151 St. Neots Road, Hardwick, Cambridge, CB3 7QJ, England.

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Competition Corner

Colin Singleton

Anything with even a hint of Geometry seems to get a resounding thumbs down in this column and it seems the same may be true of Probability. So I will stick to what everyone seems to like – Numbers.

What is the smallest integer which can be multiplied by two simply by moving one or more of its digits from one end to the other? The answer is 142857 x 2 = 285714. Note that you are not allowed to shuffle the digits, they must remain in the same cyclic sequence. The smallest for a multiple of three is 076923 x 3 = 230769. Leading zeros are, of necessity, permitted in this puzzle.

That's all there is to it! Can you find the smallest solution for multiples 4, 5, 6 ...? If you cannot guarantee the smallest then list the smallest you can find. Brownie points will be given for a continuous list of multiples and for finding smaller solutions than anyone else.

If you manage to churn out solutions by the hundred, I suggest you send them on a spooled disc so that I can compare entries by program.

Entries and comments please either via Paul at N.C.S. or direct to me at 41 St Quentin Drive, Sheffield S17 4PN.

Results sequence

The July Competiton (circles through grid points) nearly had to be cancelled for lack of interest. It was actually an exercise in numbers which are the sums of two squares in several ways. Fred Hartley of Hayes, Middlesex, wins the prize for a solution including a seven-point circle somewhat smaller than mine.

There were a few entries for the next one (prime numbers forming 'word' circles). Two entrants managed to form a single circle using the 1229 primes less than 10000. One of these was Dr Riha, on whose suggestion the problem was based. He declined to submit his entry officially, so the winner is Nick Craig-Wood of West Horsley, Surrey. Congratulations Nick!

Congratulations too, and not for the first time, to Hans Kommeren of Breda, Netherlands. Quite a number of readers found that there are 105 097 565 primes less than 2^{31} and a few went up to 2^{32} (203 280 221 primes). Hans, however, went up to 2^{38}, which took his ARM code program some 120 hours! I can only assume that his answer of 10 662 661 172 is correct. Incidentally, the fastest program, as usual, was Dr Riha's. It got to 2^{31} in 47.31 seconds! A

PipeLine

Gerald Fitton

This month I am going to try to catch up with the post you've sent me. Once again, let me start by thanking all who have written to me. In the first draft of this article, I put in acknowledgements to all the people who've written in with problems or solutions, but I found the file growing beyond a reasonable size. So, if you recognise your contribution here, be sure that I and many others are pleased that you've made it. I am sorry if your name doesn't appear in the list of honours.

So, for this month, I've cut out the tutorial I had prepared and I'm sticking to your letters! They are mainly about new problems and the solutions to earlier ones. Let's start with solutions and go on to the new problems afterwards.

Disappearing text

Newcomers to PipeDream (and many who've had it quite a while too) complain that text seems to disappear when they <Tab> to change the column they're working in. Let me try to explain how it happens. PipeDream is an 'Integrated Package' consisting of a spreadsheet as well as a wordprocessor, etc. In order for it to be easy to use as a spreadsheet, the screen is divided up into separate columns (and into rows as well). Here's the way it works.

Column A stretches all the way from the left border of the screen to column A's own right margin (as shown by the vertical arrow in the row which has the ...A ...B ...C ...etc in it). The right margin is set with <Ctrl-H> and can go way beyond the 'width' of the A column. Column B starts immediately after the letter A – in fact the letter A is the right hand end

of column A's width. Column width is set with <Ctrl-W>. In other words, a column has two right hand sides, a right margin and a (right set) width.

These two right hand sides of a column are used differently by text (words) and expressions (numbers and formulae). The result of evaluating an expression is forced to fit into the column width because the assumption is that you're doing spreadsheet work if you use formulae. Text, however, can flow up to the right margin (which is usually set to the right of the column width). If you choose the Files-Option Wrap to be ON (a blue star in the square), then text will wrap around when it gets to the right margin (but see my remarks below); whereas if you choose Wrap to be OFF, text can be typed after the right margin but you won't be able to see it and it won't print.

Now for the difficult bit. Imagine that you have typed a paragraph of text into a column A with a right margin setting of, say, 71 characters so the text runs across the whole page. The width of column A might be 12 characters but, in typing text, you won't notice this fact. If A has a width of 12 characters then column B starts at the 13th character (from the left of the page) and stretches to its own right margin probably somewhere near the right hand edge of the page. If you <Tab> into column B (use cell B1 for this) and type a single letter (or even a space) into cell B1, the text in column A (but in row 1 only) disappears! Don't panic, though – it hasn't really disappeared. What has happened is this; you have laid an imaginary second sheet of paper, column B, over the text of column A so that some of column A is hidden by the B sheet of paper! Of course, you can have a C sheet and a D sheet etc which overlay the earlier sheets.

If that was the difficult bit then here's the clever bit. Enter single letters into cells B1, B2 and B3. This will hide part of the A sheet. Place the cursor into cell A1 and reformat the paragraph. What happens now is that the hidden text reappears. Paragraph A has been reformatted so that the text 'flows' around the parts of column B that are occupied. This effect is difficult to describe on paper; you have to do it yourself to appreciate exactly what is going on.

Beware! If you save a file which has only spaces in a cell (e.g. in B1) then the spaces disappear when you save the file. If you want the spaces to remain in order to retain a good looking format, then you will need a 'hard space' rather than a space bar space. A hard space is most easily produced by holding down <Alt> and tapping the space bar.

Centering headers & footers

Now here's a problem that many of you seem to have. I think it was John Jordan (Wolverhampton) who brought this up first. If you have columns beyond the right hand edge of the printed page with a right margin (the vertical arrow) which is off the page then the centring is calculated by using a line which extends from the left hand end of column A to that rightmost right margin. This means that in some extreme cases the footer disappears off screen to the right and you might think you've lost it. More disappearing text!

Highlights off at CR?

The PipeDream printer driver configuration file allows you to change this option to Yes or No. Changing from Yes to No will change the effect at the printer but it will not change the effect on screen. Consequently (by looking at the screen), you may think you have only one line in bold or in italics but when you come to print it everything seems to be bold or in italics. Unless you know what you are doing it is better to leave this (Off at CR?) column at Colton's defaults – otherwise your screen won't match your printout. The 'right' way to embolden a whole paragraph is to mark the paragraph as a block (with F3) and then use the command <Ctrl-PHB> (Printer Highlight Block). The highlight numbers for 'standard' effects such as underline, bold, italic, subscript and superscript are given in the user guide but you can always use trial and error. Highlights can be compounded to give, say, underlined, bold, italicised text. Highlights are removed from a marked block with <Ctrl-PHR>.

Sending files in outline fonts

I have sometimes sent people letters on disc but made the mistake of sending them in one of the new outline fonts such as Acorn's Trinity font. The trouble is that, if you don't have the font installed, the text is displayed in the system font. Since the system font is 'wider' than Trinity, a lot of the text will be 'lost' off the right hand edge of the screen. Of course, the recipient could always reformat the text paragraph by paragraph but that is rather time

consuming! The moral of the story is to make sure that whoever you send a file to has the same font as you have; if not, then send out your file in system font. By the way, the fonts must have the same name as well – Acorn's Homerton and Beebug's SwissB are the same font but they have different names.

Dsum & month(date)

Des Fry sent me a draft version of a bank account analysis application which almost works (it did work actually, but not as well as he wanted it to). His problem was that he wanted to use the function dsum to total only one month's cheques (e.g. February's) for each of several categories of expenditure (e.g. Petrol). The monetary values of the cheques are in column F, the category (e.g. Petrol) in column C and the date (e.g. 3.2.89 for 3rd February 1989) in column A. He used dependent documents but to show you the effect I'll simplify it. He tried a formulae rather like:

```
dsum(F4F99,'C4="Petrol"'&'
                        month(A4)=2')
```

but found that dsum recognised only the Petrol and gave him the total petrol costs for the year! I had a look at this and, eventually, I finished up with:

```
dsum(F4F99,'(C4="Petrol")&(A4>=
                  1.2.89)&(A4<1.3.89)')
```

This second formula does give the sum of the February cheques. It seems that you have to use brackets (and the ampersand, &) between the compound conditions and not split the conditions with the apostrophe ('); I'm sure it suggests apostrophes in the book. Secondly, although the function month (slot containing a date) by itself in a slot does return a number (such as 2 for February), it is not recognised as a condition within dsum. This is why I had to use the longer compound condition with the 1st of February and 1st of March bracketing the month of February.

Des will have this application 'sanitised' (his word, not mine) in time for the January PipeLine disc (I hope!) so if you want to analyse your home accounts here's a PipeDream application that will help.

Vlookup & hlookup

In the latest version of PipeDream, these functions do not need an exact match but they do need the file sorted on the key field. Some of my earlier spreadsheet/databases don't work anymore because I used these functions on unsorted key fields. With the amended functions, I need to either sort the key field or change the function to lookup (without the V or H). Note that the syntax of lookup requires a range as the third parameter instead of a number (so you can't do a quick search and replace).

School timetables

Peter Wicks sent me this application, not for publication, but because he had a small problem on it. I have seen expensive dedicated (i.e. only does timetables and nothing else) software that is much worse at solving this nightmare than Peter's PipeDream application. Are you interested? If so then I'll try to get Peter to release his application for publication.

The ini file

I'm still not sure exactly how this next effect works but if you were to send me a file which uses only your default options (have a look in File-Options, those are the ones I mean) then, because your default options are different from mine, when I load your file into my !PipeDream, it uses most of my default options and not yours. That means that my screen display will be different from yours with the same file. On the other hand, if you change many of your options from your default and send it to me then the changes (from your ini default) are recorded with your file and appear on my screen.

Why do I mention this at all when many of you don't send any files to anybody? Well, if you change your ini file and then load one of your old files (saved while you were using an older ini file) you may get some surprising effects! I have sent many of you files which have caused you problems because of this effect and you must have thought I was very sloppy (or worse). I remember one I sent to John Jordan that contained a very carefully formatted spreadsheet in which I had used my default ini of zero decimal places. On his machine it loaded up with two decimal places (his and Colton's default) and looked a mess. Furthermore, the text file I sent with it quite clearly said I was using zero decimal places in various slots (which, with my ini file, was absolutely correct and looked neat). He could see quite clearly that I was using two dp! Anyway, if you send me a file which critically depends on the Options you have chosen, then send me a copy of

your ini file as well so that I can change my default options to match yours.

The Matthews' directory

On the Archive monthly disc is a set of half a dozen files by Keith Matthews. They are self-explanatory when you have the files but would take up too much space to describe in this column. These half dozen are only a small proportion of the files he has sent me. These and some others are on the October 1990 PipeLine disc with some left over (including a set of applications he has called ShowCards) for the January 1990 PipeLine disc! The ShowCards set includes a method of creating multi-row text from free format single slot records as well as a method of converting multi column text data files to that format.

The Dorling bibliography

Too many of you have asked me where this has gone! One of the reasons that I started up the PipeLine quarterly discs was so that I could include large PipeDream files and this strategy is working reasonably well. However, the truth is that Daniel's bibliography is so large now that it would embarrass me to put it one one issue of the quarterly disc because then I wouldn't be able get the rest of the material on the disc! I have a few other files in this category (containing huge sprites) and I am thinking along the lines of putting them on a 'bonus' disc which (eventually) will be sent out free to all those who have paid by annual subscription for the four PipeLine discs. Let me know what you think of this idea and, if you have some large sprites, you might like to contribute them to the bonus disc.

!Help – LQ500

Alan Afriat has an Epson LQ500 (24 pin dot matrix) printer and uses tractor feed with 11.7" long paper. He has no problems using PipeDream printer drivers; he just sets the page length to 70 lines. However, when he uses !PrinterDM (the RISC-OS driver) the driver default is for A4 paper on which he would like a set up of 70 lines. He wants to know if he has to change anything in the PrData file, or anywhere else for that matter. If you can help then drop me a line.

!Help – Protected slots

Do you have problems after replicating protected slots? Some people do and some don't. If you have had this problem and fixed it, please let me know the solution. The only solution I know of is to Save the file, Close it and then Load it back in again; the problem disappears!

!Help – IBM graphics

I have had a letter (on disc) from Dr Anton L Mans (Durban, R.S.A.) which, when printed, runs to about three pages. I have been able to help with some of the points he has raised but not all; maybe you can. Rather than print a precis of his letter in this column, I am sending the disc copy to Paul for inclusion on his monthly disc. If you take that disc and feel able to help (particularly with IBM graphics for a Star LC-10) then please reply to him directly. An air mail letter to South Africa (10g to 20g) is currently 53p. By the way, I am hoping to put a PipeDream file of overseas postal rates on the January quarterly PipeLine disc. *(I hope Gerald means the new rates – they change again in Januray 1991. Ed.)*

!Help – Epson GQ-3500

I use this laser printer but, to use it with !PrinterLJ, I have to plug in a Hewlett Packard emulator card. Has anybody got a PrData file for !PrinterLJ that will allow me to use the Epson GQ-3500 without the HP emulator card?

!Help – "Print cancelled"

Elwyn Morris and a few others are still having a problem with "Invalid number of output bits – print cancelled". I had this problem only once when using one of Maurice Edmundson's files and I could not repeat it. Elwyn gets this problem so often that it makes RISC-OS printing almost unusable. I have sent him copies of all sorts of modules that might have anything to do with this but we can't find a solution. Why does it happen to him and not to me?

!Help – Stack overflow

More recently I've had the occasional "Stack Overflow" when using files sent me by other people (but with none of my own). I never used to get this problem. Have I installed too many fonts (I've got about 63 or 64) or is the problem elsewhere (ini again)? Three other people have written to me about this problem and have put it down to small memories, large spreadsheets and long formulae. However I got the problem when I loaded somebody else's simple spreadsheet with only a few short formulae (but it did have one dependent document) into my

4M 440; it crashed my machine twice! However, I reloaded PipeDream V 3.07, loaded the file and the dependent document from his disc and, without making any changes (that's when it crashed), saved to my own disc. I then powered down completely, restarted with the latest version of PipeDream and I've had no trouble with that file since!

(We had the same problem when we were translating N.C.S.'s accounts onto Pipedream. Rob Macmillan told us that it was a problem inherent in the Clib routines (I think he said). Anyway, in most situations, it can be solved by using column recalculation instead of natural recalculation <Ctrl–FO>. Ed.)

!Help – Sideways scrolling

Joe Buhagiar (Victoria, Australia) would like to <Tab> across the columns of a wide spreadsheet (e.g. one with, say, 50 columns) about a screen at a time with a single key press. The scroll bars do this nicely in the vertical direction but <Tab> moves only one column. Has anybody got any ideas how to move several columns at once?

!Help – Z88

I don't have a Z88 but quite a few people have asked me to include hints and tips on the use of Z88 PipeDream files with the Archimedes. How do you feel about that? If you have a Z88 you want to sell me at a discount then drop me a line please.

Disc copies of PipeLine files

Disc copies of many of the files mentioned in this article are available from N.C.S. by buying their monthly disc (£3.00), others are on the quarterly PipeLine discs (available from Abacus Training). The annual subscription for PipeLine discs is £18.00 for the four discs July 1990 to April 1991 inclusive (or an extra £8.00 if you've already bought the first two at £5.00 each). The January 1991 disc will be issued during the first week of January 1991.

Contributions

Thanks for all your contributions and particularly for supporting the PipeLine Discs. I'd like you to keep up the 'good work' too – I enjoy reading your letters even if it takes me some time to reply. A

Hardware Column

Brian Cowan

I had hoped, by now, to be the proud owner of a beautiful new 540 machine and my column would have told you all about it and how wonderful it was. Well, that is not to be. I don't know exactly what the problem is, but as Paul said last month, it can't be the alleged "unforeseen demand" when there still appear to be less than one hundred machines in circulation. I think that even Acorn would expect to sell more than one hundred of a new model! The popular explanation is that the new batches of ARM3 chips will not quite run at 30 MHz and so they are being hand-picked rather than reducing the specification of the machines.

The reason I am moaning in this uncharacteristic manner is that on my desk at work I have an original Archimedes 310 machine with a six inch monochrome monitor; my upgraded 410/1 and Taxan monitor have gone to a "serious" user. All of our other machines are in constant use, mainly running experiments and processing data, and that is all there is to spare. The contrast between that and my 410 +ARM3 at home is incredible. So you will appreciate my eagerness to replace the 310 with something rather more substantial.

Upgrading 310 machines

But all this got me thinking about all those 310 owners out there. Judging by the adverts that one sees in Archive and elsewhere, quite a few people are trying to sell their 300 series machines and move up to something more powerful. But things are not so bad for those wishing to upgrade the old 310 models.

The main area which people see the 300 machines lacking is in RAM capacity. There seems to be a Parkinson's Law associated with RAM: "Programs expand to fill the RAM available". In the old days of 64k computers, who would have thought of complaining that one megabyte of RAM was not enough? So far, I am glad to say, I have not had a case where four megabytes was insufficient but I suppose that that time can't be far away.

RAM expansion

I am still not happy with the various RAM expansion schemes for the 300 series machines. They seem to be expensive for what you get and I assume that is why people prefer to go for a new 400 or A3000 machine. I am not really criticising the pricing policy of the suppliers; the hardware associated with the boards is complex and therefore relatively expensive to produce. I have been thinking about installing my own RAM upgrades in the two Archimedes 300 machines I still have but it is not a trivial job.

Coprocessors

There are other areas for expanding the 300 machines. Maybe you have a RAM upgrade already. In which ways can such a computer be enhanced to match the new 540 series? Obviously you can add an ARM3 although you will need to have installed the MEMC1a upgrade first. What about a coprocessor: the other main area for complaining about the 300 models.

Here we have some good news. Interested people will know two things quite clearly about coprocessors. Firstly, there is no coprocessor bus on the 300 series machines and, secondly, you can't use the Acorn floating point coprocessor with an ARM3. So what is the good news? It relates to the new Floating Point Accelerator which Acorn are developing. This will be a custom- designed coprocessor, unlike the old unit which used a commercial (if obscure) maths coprocessor together with a massive "glue" chip.

The plans are for the new FPAs to be installable in the 500 series machines. Either they will be fitted onto the existing CPU cards or there will be some upgrade/trade-in scheme operated. Although I have no authority for saying so, I am sure that some companies will be producing ARM3+FPA add-on boards for the "old" 400 series machines and the good news is that these upgrades will be equally suitable for the 300 range. So, owners of Archimedes 300 machines will be able to upgrade to FPAs.

Video upgrade

The two other areas for upgrading are the video speed and the RAM speed. It is now clear that the VIDC enhancer sold by Atomwide is designed to give the same video as the new 540 machines. That is quite an easy upgrade to install and it is reasonably priced. Unfortunately, you still won't get the super

high resolution mono modes but then who has a monitor to give such resolution?

No RAM speed-up

There was some talk of a third party company selling a RAM speed-up upgrade for machines whose RAM could cope with the higher speeds. This is unlikely to come to fruition as it turns out to be quite complex to implement. Running the RAM faster has nothing to do with the presence or not of an ARM3 processor. The RAM has to be run asynchronously from the rest of the machine such as the keyboard, VIDC and all other IO, and so, every time an IO transaction occurs, things must be re-synchronised. Unfortunately, such a modification involves cutting tracks on the circuit board and it can't be implemented simply. Also, there is no chance of running RAM upgrades faster than the rest of the machine.

That summarises the upgrade position and the conclusion must be that things are not as bad as all that, particularly when the FPA comes along.

A possible future ARM4

There were some comments in last month's Archive about the FPA which I did not quite agree with. The general idea was that it is a waste of time for Acorn to be producing an FPA; what they should be doing is to incorporate these facilities in a new ARM4 chip. Well I am quite sure that this will happen in due course but the production of an FPA is an important intermediate step. Hopefully, the FPA will be a resounding success. Even though its functions will have been simulated and tested exhaustively before actual manufacture, there is still the possibility of minor bugs appearing after testing of the real thing. There may then be hardware "fixes" such as with the old MEMC chip. This is possible with an FPA plug-in, but it would be difficult with an entire new CPU.

Acorn's design philosophy

The design philosophy of the ARM system is brilliant – witness the way the ARM3 has evolved with such remarkable compatibility with the ARM2. The ARM2 has been tried and tested and it turned out to be fine. The ARM3 includes an ARM2 on its chip together with the RAM cache and controlling logic; the design does not have to start from scratch. Similarly with the ARM4, we may expect to see a chip containing the ARM3 together with a proven FPA implementation. To the user, there will be no apparent difference.

Copestake IDE hard discs

I have just received an IDE hard disc unit from Ian Copestake Software. It only arrived yesterday and so I have not had time to do a serious evaluation; a full review will appear in the next issue of Archive. IDE stands for Integrated Drive Electronics and, as you will therefore guess, most of the drive's intelligence is incorporated in the controller electronics. So the interface card for the Archimedes consists, essentially, of some bidirectional buffers and a ROM which contains the IDE filing system and the associated filer.

Since the interface board is so small, it can either be installed in a backplane slot or, for 310 users without a backplane, it can be plugged directly into the backplane socket on the main PCB – clever! Installation of the drive was relatively straightforward; it would have been a doddle if I had had better instructions.

First Impressions

Having used the drive for a few hours, my initial impression is favourable. Everything I have done has been successful. I "dragged" over my !PC application directory, which contains a 5 megabyte partition, and it copied over perfectly. All I then had to do was to change a few references from ADFS to IDEFS in the various !Run files and the PC emulator booted up perfectly first time. Although I have done no serious speed tests as yet, the "feel" is that it is quite fast.

Cumana disc cartridges

I want to finish this month with a brief mention of the Cumana removable disc cartridges. I have written about these in the past and you might remember my initial enthusiasm for the system. I have been troubled by errors appearing on the discs. Very roughly, I get about one error per week and this results in the disc not verifying. This is, of course, a complete disaster. At the moment, I can't use the discs for storing anything of value except where I save everything twice; effectively reducing the capacity from 20 to 10 megabytes. So far, I have had no joy from Cumana but they are "looking into it". Have any readers any experience of these drives? Have any readers any experience of the MR45 removable drives? A

New Comms Packages

Tim Saxton

When the Archimedes first came out, there were some fairly obscure but inhibiting problems with the serial port system. This got the machine off to a rather poor start in the comms world. The arrival of RISC-OS and the upgrading of the hardware chip has solved these problems but where are the RISC-OS compatible comms programs? The answer is that they are arriving slowly.

Before RISC-OS there were two major comms packages: Hearsay, from Beebug, and Arcterm from The Serial Port. Both of these now have versions that perform well with RISC-OS, but they do not multi-task. Although you don't lose the programs or data you have in other applications running under the desktop, you cannot see or access them until you quit from the comms package. Both of these packages provide a plethora of facilities, with Arcterm winning in 'Bells and Whistles' and Hearsay winning on screen presentation and use of the mouse.

First ever multi-tasking terminal?

The first of the true RISC-OS terminal programs was hidden away on a disc called 'RISC-OS Extras' from Software Solutions. It had no file transfer facilities (other than sending an ASCII file straight down the line) and was described as a simple program to give easy access to things like Telecom Gold. Its major problem was the screen updating and scrolling. The rewriting of the screen was very odd, the whole screen being rewritten with every new line, and this made a screenful of text very tiring to look at, to say the least, but it really did multi-task.

It was very nice to be preparing text in, say, Edit while on-line. There was nothing else, and I was prepared to put up with the dreadful window flicker to have the multi-tasking facility. (Perhaps I should explain that a lot of my comms work is done currently with Packet Radio, where the response time can be very slow, particularly if the system is busy, and waiting a minute or more to get a reply is fairly normal. This doesn't really matter, as there are no phone line or connection charges, and being able to get on with something else while waiting is a definite advantage.)

There was then a long gap before any more packages came out but, in the last few months, some new ones and an 'upgraded' old one have appeared. The new ones are 'RISC-OS terminals' from Ian Jones, 'Acom' from Wim Rolin in Holland and a new version of 'ArcComm' by Peter Gaunt.

ArcComm

Starting with ArcComm – this is not multitasking but simply a new version of the old program. I am afraid it has most of the problems of the old program – i.e. the response to mouse clicks is too slow and, because it basically pre-dates RISC-OS, it does not conform to the standard user interface. That said, it is a well presented package, excellent instructions in a very well made manual, and it is the only available software, as far as I know, that handles the three European Teletext standards. There is a limited number of different modem drivers included but, as each one is a module, it is not really possible to add others yourself.

At £31, it was reasonable value, not giving the facilities of Hearsay or ArcTerm, but for less cash.

RISC-OS Terminals

Turning to the first of the new batch, 'RISC-OS Terminals' available from David Pilling, is in fact three applications. One for viewdata mode, the others for ANSI(VT100) terminal emulation, all written by Ian Jones.

Using them is quite straightforward and they work well with most BBS's and viewdata systems. Double clicking on the application directory opens an appropriate window; using the menu button in the window allows further options to be selected, including a useful keypad. Closing the window while on-line does NOT disconnect the modem, so beware!

The characters used for Viewdata are quite attractive, although the colours are desktop colours and look slightly odd on a teletext screen until you get used to them. A teletext screen editor is provided, but that is being reviewed elsewhere. File transfer covers all the X-Modem variants and ASCII for the ANSI terminal, or CET for viewdata.

A possible limitation is that the maximum baud rate is 2400, which covers most dial-up modems but, as higher speed modems drop in price, it could become more restrictive. Spooling to disc is provided and the teletext save format is compatible with that used by Hearsay.

The reason there are two ANSI terminal emulations is to overcome the annoying fact that you cannot get 80 characters visible in system font in a mode 12 window. This means that any incoming line that is a full 80 characters long (i.e. standard line length) overflows onto the next line, looks very untidy and is difficult to read. The application called !Tansiism uses slightly narrower characters, allowing a full 80 characters across the screen – very nice!

It is possible to customise command strings to send to the modem (Hayes is the default) and complete log-on sequences can similarly be built up. Dropping one of these onto the main window causes the configuration to be set appropriately, the BBS to be called and the log-on sequence to be performed. Each of the three terminal applications takes 184k of memory when running, which makes it quite suitable for a 1M machine.

There is no paperwork at all, but some 50k bytes of readme files on the disc are adequate if you know a bit about comms. Free future upgrades are promised for higher speed and VT220 emulation. For £5.99 you really can't go wrong.

Acom

The third and most recent offering, 'Acom', is a single application which installs on the icon bar in conventional fashion and allows the choice of terminal type – viewdata, VT52,100 or 220, ANSI and BBC VDU, which covers most requirements. (BBC VDU allows graphic images, etc to be displayed and responds correctly to all the VDU commands.)

Clicking on the icon bar icon opens a window of the appropriate dimensions for the terminal type with, again, a nice teletext font using the desktop colours by default. It is possible to select 'true' teletext colours but they make the rest of the desktop look decidedly odd! There is a very comprehensive teletext editor system provided with lots of facilities but that is, again, being reviewed elsewhere. The default modem type is Hayes, although other dial, etc command sequences can be set. It is possible to pre-program the function keys with text. Baud rates up to the Archimedes' maximum are catered for.

In use it is all fairly intuitive, conforming quite well to the RISC-OS conventions. There is a phone directory for the commonly used numbers, which will also configure the software appropriately. Again it is quite possible to close the main window and remain on-line (and transferring data) which could be a bit dangerous for the phone bill – the only indication is the standard Acom icon on the bottom bar.

The CET file transfer takes no notice of the file name downloaded, just using the name AcomTmp, which means you must either move it or rename it before the next download unless you want to overwrite. X-Modem transfers and ASCII file transmission both work conveniently by dropping icons on the text window (a text file is sent as ASCII, and anything else by X-modem, although you can also send ASCII files by X-modem if you want). However, a failed attempt at X-modem reception leaves the file open, necessitating a trip to the command line.

There is also the facility to 'chat' to another Acom user while transferring files – could be quite useful, but I didn't test it. It is possible to spool all comms sessions to disc and then 'replay' them. Several example replay files are included on the disc. This second new application is quite a bit larger than Ian Jones offerings, using 384k, so there's not a lot of room for other tasks in a 1M machine.

Again there is no paperwork, just a rather short readme file (three A4 pages). However, on-line help is available, which perhaps does make it more suitable for the comms beginner.

Priced at £28, Acom represents fair value as a 'standard' RISC-OS comms package, although there are a few rough edges yet and, when compared with the documentation and presentation with ArcComm, it has a long way to go. There should really be much more comprehensive written instructions.

One oddity I found with both 'RISC-OS terminals' and Acom was the inability to get the modem off line! You had to depend on the far end cutting its carrier. Acom has a facility (in the phone directory) to go off line but I couldn't get it to work reliably.

Care needs to be taken in what you do when you're on line and particularly when transferring data. If you perform lengthy or "unco-operative" tasks at the same time, any of these multi-tasking comms applications can fall over. For this reason, I imagine, Acom inhibits the <ctrl-f12> access to the command line when the main window is open.

Summary

In summary then, ArcComm has been overtaken by RISC-OS and, although it is good, it is not really the way comms on the Archimedes is going.

Both the other new offerings are competent and allow standard comms to be multi-tasked under RISC-OS. Beware though that what else you do has to be chosen with care, as high baud rates and long non-returning operations in another task can crash the comms.

Neither package offers as much customising or 'bells and whistles' as ArcTerm but, if you have a fairly standard modem and want to use SID, Prestel or standard Bulletin boards, either comms package will do a quite adequate job. However, the price of £5.99, more comprehensive instructions and better configuration options given by 'RISC-OS terminals', must make that better value for money, unless you need the higher baud rates. A

The WIMP Game

Karen Dunkley

The Wimp Game, from 4th Dimension, is an original game that makes full use of the RISC-OS desktop. The game is loaded in the same way as any RISC-OS application and puts an icon on the bar. Clicking on the icon in the usual manner will produce a window on the screen with a tune (Starlight Express) playing and a pen writing the name of the game on a board.

The basic idea of the game is to start with an Acorn Atom and end up with a R200 workstation by progressing through a series of rooms, solving puzzles as you go. I can assure you that this isn't as simple as it sounds as some of the rooms are guaranteed to have you stuck for some time. Personally, I spent most of my time in the bar and not because of a love of drinking either!

The graphics are good, with plenty of attention to detail. Objects that are dropped make the appropriate noise and others will break. A magnifying glass feature is included and this can zoom in and out on any object. Of course, this isn't just there for the fun of it – expect to be forced to use it sometimes!

The game is designed to run in Mode 12 and there is a warning about this if you load it in any other mode. Although the game does tell you how to change the screen mode, I do dislike having to use it on a multisync monitor. Unfortunately, while Mode 15 and Mode 20 are possible, they are not really viable options as the game is much slower when moving between rooms.

My first impression was of amusement as some things are quite funny. In the first room try turning on the fan and then clicking on the blades. Don't say I didn't warn you! Needless to say any humorous side effects don't affect other RISC-OS applications.

The instructions supplied are quite comprehensive. They explain how to use the game from a floppy disc, hard disc or RAM disc. The game can be copied on to a hard disc or RAM disc without problems – the only requirement is that the original floppy disc has to be in the drive when you load the game. Hopefully 4th Dimension will supply a free replacement floppy disc if the original develops faults(?)

The Wimp Game will run happily on an unexpanded 1M Archimedes and leaves enough memory for !Edit to be loaded. The speed of the game is not affected by only having 1M available. The information booklet includes a section with information about most of the computers produced by Acorn – this information may be helpful in solving the game so do read it!

All in all, The Wimp Game is an original game. Hopefully we will see more games that multi-task with other applications. I only have one complaint about this game – it prevents you from getting any other work done!

The Wimp Game is £19.95 (£18 through Archive) – a trifle overpriced methinks, but it is well worth buying. A

DTP Column

Ian Lynch

I notice that there seems to be some comment about the increased review content of Archive. There seems to be so many new software titles and add-on gadgets for the Archimedes that it is difficult at present to avoid this and I am afraid that in this month's column, I am adding to the reviews, owing to some new equipment I have at my finger tips. However, I will try to add some technical background as well. I am now going to make you all jealous by saying I am typing this on my new recently delivered A540 using Impression 2.04 and Scanlight Plus and a hi-res Laser Direct. No, I didn't buy it all personally. I need good reprographic facilities for my work and, at present, I know of no other system which enables the productivity and quality of output of this combination. But first some correspondence...

Correspondence received

Mr Swain has taken me to task over the technical accuracy of the comments I made about 'cold-metal' technology in the print industry. I come clean Mr Swain! I know very little about the print industry before the advent of computers and just read up a bit for the column so I could put some of the more recent events into a broader historical context. If anyone is interested in the work of compositors and composing perhaps Mr Swain can send me a book list which I will pass on. In any event, thanks for your letter and I promise not to mention anything pre-1980 again.

Douglas Weller has passed on a hint concerning fonts which will be helpful to those without a hard disc. Unlike Impression 1 and other applications, Impression 2 allows you to add fonts to the !Fonts folder while it is running. Selecting the folder again causes to accept the fonts.

Someone (I can't remember who) asked about Kaga NLQ on the Impression draft print mode. The Kaga driver supplied with Impression 2 should get round the fact that the Kaga and Canon dot matrix printers use ASCII 40 (I think) to switch NLQ on and are therefore not Epson compatible in this respect.

Scanning

Gerald Williams has been using Impression Junior and is very pleased with it. He is puzzled about how better results can be achieved by printing at 600 dpi when the scanned image is only input at 200 dpi. I must admit this does seem strange but the factors affecting image quality are varied and complex – this is another area I'm just getting to grips with myself. First of all, scanned images are often extracted from their source as simple monochrome sets of dots and in raw form look surprisingly poor. It is amazing how software processing makes a massive difference. If the source image is made up of dots itself, there can be problems with the relative alignment of dots on the image and the pinpoints of light used by the scanner to pick them up. It may even turn out that scanning at a lower resolution improves the image.

The manual that comes with Scanlight Plus explains how grey scaling (or half-toning as it is often called) is achieved. This is a brief synopsis: Basically, if groups of dots are averaged they can represent a grey shade. For example, consider a noughts and crosses grid viewed from such a distance that the eye cannot resolve (pick out as separate) individual squares. If all the squares are black the whole grid looks black and if all the squares are white the whole grid appears white. But if only the centre square is black the grid looks almost white and if only the centre square is white then the grid looks almost black. For nine squares there are 512 possible patterns as with a 9 bit number, but many of the patterns could result in a very similar effect and in practice you would get 9 grey levels from this. Note that if we are grouping dots in this way we are losing resolution.

In fact, obtaining realistic images is a combination of resolution and grey scales. Even in a multisync screen mode, the 640 pixels horizontally correspond to about 640/18 or 35 pixels per inch. However, 256 colours for each pixel make images look very realistic despite relatively low spatial resolution. Very good half-toned pictures result from 100 dpi and 64 grey levels. If a sprite is scanned with a 400 dpi scanner and the dots are grouped in 8x8 groups a 50 dpi 64 grey level sprite can be produced. If the result is now printed at half size the result is effectively printed at 100 dpi and 64 grey levels.

Even so, this is not the end of the story because the printer driver must use dithering to produce grey levels in the printed image. Dithering is the reverse process to that described above. Instead of grouping points together to produce grey levels, a grey level is used to determine a pattern of dots to simulate it. The exact dithering technique used depends upon many factors. The size of the dots, their shape and their separation are all important. If you look at the images shown oppositescanned at 300x300, 300x600 and 600x600 you will see how the lowest resolution looks very grainy and the highest smoothest. However, I have found that in some cases 300x600 seems to give a more realistic set of grey scales and in these cases seem more true to the original.

I am not yet very experienced with the Scanlight Plus scanner, having only had it a few days – a little experimentation is needed to get the best results. You can even change the contrast and relative intensities of each grey level by dragging bars with the mouse. The software is very easy to use so this shouldn't put anyone off. Given the complexities of sampling and dithering, not to mention trying to get a device originally designed to print at 300 dpi to print at 600 dpi, it is not too surprising that to produce scanning and printing software that does justice to the Archimedes has taken some time but they are emerging at last and I think we will probably see further improvements as time goes on. Incidentally, ChangeFSI and Translator both use similar techniques to those described above in order to convert pictures from different machines into readable formats.

DTP packages

On the more general DTP front, I have now got a copy of Impression 2.04 and Impression Junior and Ovation's spellchecker. Impression 2 is a significant improvement on what was already a very powerful product. Apart from adding new features such as the ability to rotate graphics in frames and group frames, many of the existing features have been made easier or more flexible in use. Computer Concepts seem to have listened to the customer and responded accordingly though inevitably they will not please everyone. I still have two major items on my wish list. First is for timed auto-save (rather than automatic backup which takes up disc space and can cause problems for floppy users). You can always rename the file at the beginning of the work session if you want a copy of the original.

The second wish is a bit more demanding. Mail-merge is a must in most offices and if Impression is to compete with the large PC wordprocessing players such as Wordperfect, it must have a mail-merge facility. It is possible to use the Document Description Format and frames to mail-merge but it is not straight forward enough for non-technical users. This facility is also lacking in Ovation and something which needs to be considered by any company which wants to make a serious challenge for a place in the business world. This aside, I believe that Impression 2 is the most sophisticated piece of software available for the Archimedes (in some ways superior to RISC-OS itself) and at least a match for the heavy weight applications on the Mac and PC's. What do you think?

Impression Junior has also found its way to me and it is basically a simplified version of Impression 2. Note that it has a number of the Impression 2 enhancements and is arguably more powerful than Impression. The main things missing are the style and master page definitions, but many users will not find this a major limitation and new users will find things easier to learn. I have had virtually no correspondence concerning Ovation but there must be some of you out there using it. Please write with comments. I have been playing around with it now that the spell-checker has arrived and it is a very nice application with a particularly fast screen refresh at large font sizes. The fact that I use Impression for work means that I am inevitably much more familiar with it so come on you Ovation fans let's here from you.

History

Last month I said that the Archimedes was the next logical step in the DTP evolutionary process. It is because the Archimedes provided the processing power at the right time enabling Acorn to provide the outline font system, shared printer drivers and multi-tasking desktop supporting direct in-memory transfer that the DTP software producers were able to provide the tools which really are ahead of the opposition at the present time. Acorn's outline font manager enables outline font definitions to be used to generate the bit maps for the screen and the printer

whenever they are needed. In order to do this, a cache is used. This is an area of memory in which the bitmaps currently in use are stored and they are worked out as the font manager takes the information from the !Font folder on the disc. Obviously, the font cache can fill up and this is why more memory gives better performance, since fonts do not have to be constantly pulled up from disc. In all honesty, any Archimedes system needs at least 2M to do it justice and a hard disc and ARM 3 also make a difference. Outline fonts are then a major contribution to improved DTP, but direct in-memory transfer between applications running at the same time on the desktop also makes the environment very productive. Mac's and PC's have at least one intermediate stage in pasting to a notional clipboard and often, particularly in the case of PC's, file format changes are needed making the system more difficult to learn and less efficient in use. Faster hardware and developments in software will mean that the PC's and Mac's will offer similar facilities in time but the lack of an established software base can be an advantage to the Archimedes as well as a problem. The inertia of many users on 'old' wordprocessors, and a proliferation of them in the PC world, may confuse the new user and encourage software writers to produce material for the lowest common denominator and this causes stagnation. How many software applications actually make use of the power of a 386 let alone a 486? The longer this persists the better for Acorn and the third party suppliers.

Another bottleneck to productivity in the traditional DTP world is the page printer itself. The processor in the printer together with the memory needed to map the image and, in the case of Postscript, the need for an expensive interpreter, all leave a lot to be desired. LaserDirect and ArcLaser both show what can be done if the shackles of the 'industry standard' mentality are released. While PC offices conform to standard 300 dpi images and expensive printers and argue about the next standard and who should decide what it is, my 540 is churning out 600 dpi graphics at lower cost and in a fraction of the time. The longer this persists, the further ahead the RISC based technology will get. All the conspiring between the MS-DOS vested interest groups will not stop me loading my Wordperfect file into Impression and carrying on with greater efficiency. It is a sad fact that many people are too confused and scared by the DOS juggernaut and red herrings concerning compatibility to realise that there are, in many cases, better alternatives.

A recent visit to Software Solutions and a preview of Genesis 2 makes me think that a Genesis column is a must in Archive. I shall say more about this later. Paul has agreed to me swapping to this and a very able replacement has been found for the DTP column in Alan Wheelhouse. Since he does not live far from me I can pass things over to him fairly smoothly and still get my oar in from time to time. Keep the correspondence coming, take care of yourselves. A

300 x 300

300 x 600

600 x 600

Using the PC Emulator – Part 6

Richard Forster

In part 3 of this series, I briefly mentioned using a ramdisc on the PC emulator – and I would like to say a little more about this before we start on the main item for this month, namely Batch files.

To recap, there is a file on the boot disc called RAMDRIVE.SYS which, when called from the file CONFIG.SYS, using the command DEVICE, will allow us to create a ramdisc. (A ramdisc being is an area of memory which works like a fast disc drive.)

If you placed the line

```
DEVICE = RAMDRIVE.SYS
```

in your CONFIG.SYS file and then re-booted you would have found yourself with a new drive, 64k long. While this is useful, it is unfortunately too small. As with the Archimedes, many of the PC's files end up being hundreds of kilobytes long and obviously we could not use the ramdisc to accommodate them.

Fortunately we can specify the amount of memory we want used for the ramdisc. This allows us to strike up a happy balance between memory we can free for the ramdisc and memory we need to actually run programs. To use a different amount of memory you simply add it to the command line. So to have a 200k ramdrive we would need the line:

```
DEVICE = RAMDRIVE.SYS 200
```

To try and remember what we learnt last time, and to see how it actually works, we shall enter this line into the file CONFIG.SYS using edlin. First make sure that edlin, config.sys and ramdrive.sys are in the root directory, and then type in:

```
EDLIN CONFIG.SYS
```

What you do next depends on the contents of your file CONFIG.SYS. Usually CONFIG.SYS files are short and so typing in just "l" should suffice to list it. If you have a line already containing a ramdrive command then type in its line number and then edit it. If you have not, type in "i" and then enter the above line, typing in <ctrl–C> to finish. After you have done so, type in "e" and then re-boot the machine (either by re-running the emulator or by pressing <ctrl–alt–delete>).

As previously mentioned, a ramdisc is very useful for copying purposes, especially if you only have a single drive. In fact, it is the only way of using the commands GETFILE and PUTFILE on a single drive machine. A word of warning though – once the machine is rebooted or turned off, all data stored on the ramdisc is lost, so you must save information you want from it first.

Batch files

Coming to batch files, we encounter one of the more useful types of file available to us. Basically, a batch file is a list of commands which the computer executes as if each one had just been typed in. Thus, a batch file containing the following would first change directory, then type out a file, and finally run a program:

```
CD \PROGGIES
TYPE INFO.TXT
MYPROG
```

Batch files are one of the few special files within MSDOS and, as such, they must always have the same three letter extension to them, .BAT. If you pause for a moment you will realise that we have already come across one of these files, AUTOEXEC .BAT, which (if you have been following the series) so far is empty and simply prevents us from having to type in the time and date whenever we use the emulator.

Before we get on to creating batch files, a few words about running them. The first and most important thing to remember is that we can escape from a batch file at any time by simply pressing <ctrl-C>. As soon as MS-DOS has completed the command it is executing, the computer will ask you to confirm termination of the batch file (pressing <Y> will quit).

The other points are not quite as important (but must still be kept in mind). Firstly, MS-DOS must always have access to the batch file when it is running. If you remove the disc it is on while the batch file is running, you will be requested to reinsert the disc so that it can continue. Secondly, if an error is encountered in a batch file, the computer will not stop but merely display the error message "Bad command or file name" and continue on to the next line.

The final point involves nesting batch files. Nesting involves calling one batch file from inside another. If you do this, the second batch file will quite happily be executed but, on its completion, control will not be passed back to the original batch file. While this does not matter if the calling is done at the end of a file it must be noted when it is done in the middle.

Actually, it is possible to call one batch file from another and return to the first but it involves a little trick. If you cast your mind back to the start of the series, you will remember the fact that the PC loads its operating system from disc and not from ROM. While this is a disadvantage (both in time taken to set up the machine and because of ease of transferring viruses, etc...) it does have two advantages. Firstly, the operating system can be easily updated and, secondly, we can run several copies at the same time.

By using

```
COMMAND/C
```

we can run a second copy of MS-DOS temporarily. So, to execute a second batch file from within a first, we must place this before it on the line. So if before the line was just:

```
PROGGY
```

it would now be

```
COMMAND/C PROGGY
```

The previous bit may well be "running before we can walk", but knowing how to do it allows the building of small utility batch files which can be called from other batch files. A library of useful files can thus be made quite easily.

Entering batch files is easy as long as you have a simple text editor – that is why we looked at edlin last time. From now on, you should use edlin to write any text files which are more than a couple of lines long. Batch files are actually just text files where the text on each line is either an MS-DOS command or a special batch file command of which there are a few.

To demonstrate the use of batch files, we shall create a couple of them, called ANSON and ANSOFF. These two files will allow us to switch between having ANSI.SYS loaded and not loaded, by simply typing in one word, as opposed to having to edit the file CONFIG.SYS and change a line in it.

If your CONFIG.SYS contains a line to activate ANSI.SYS then make a copy of it with the filename CONFIG.OFF. If it does not contain a line to do this make a copy of it called CONFIG.ON. When you have done this, load the copy into edlin and change it so that if, before it loaded ANSI.SYS, it now does not and vice versa. When you leave edlin you will have two files. The new version of the edited file is correctly name (as if it now contains no ANSI.SYS line it will be called CONFIG.OFF etc...) and a second file called CONFIG.BAK. You should rename CONFIG.BAK so that it is called either CONFIG.ON and CONFIG.OFF depending on its contents.

With any luck you should now have two files, CONFIG.ON which contains the line:

```
DEVICE=ANSI.SYS
```

and a file CONFIG.OFF which does not. Now it is time to create the batch files. First create one called ANSON.BAT with the following contents:

```
DEL CONFIG.SYS
COPY CONFIG.ON CONFIG.SYS
```

and a second called ANSOFF.BAT containing the commands:

```
DEL CONFIG.SYS
COPY CONFIG.OFF CONFIG.SYS
```

To change between having ANSI.SYS loaded or not you now simply type in either ANSON or ANSOFF and then do a re-boot.

The main use of Batch files is obviously when you would otherwise be repeating a set of commands frequently. A common example of this would be when you are trying to run a file in a different directory. If you created a batch file as below, then by simply typing in the batch file's name, you would run your difficult to get to program.

```
C:
CD \APPS\WPS\DOCS\REVIEWS
WORDY
```

Batch files can be particularly useful in these situations as you can just give them names like "A.BAT" and then run your program by simply typing in a letter.

Next month, we shall look at replaceable parameters in batch files and some of their special files. A

Language Column

David Wild

I recently bought a copy of Rhapsody, which seems to be an excellent program and which, I hope, will teach me quite a lot about music. I was very interested to see that it, like Genesis, is written in compiled BASIC. Here is further proof, if we needed it, that the most important factor in producing results is the quality of programming rather than the language used by the programmer.

Any regular reader of this column will be aware that I don't like 'C'; nor do I like coffee but there is no way that I would let my preferences, in either case, interfere with what other people want to do – so long as they don't want to force me to conform to their prejudices. I do get a little bit upset by people who imply that if you're not programming in 'C' you can't be doing serious programming, and I do get annoyed by people who criticise other people's choice of language without knowing anything about the way in which it works. A correspondent on SID recently told me that Pascal was no good "because it couldn't deal with external files"!

Each of the procedural languages, 'C', Pascal and BASIC, as available for the Archimedes, has its strengths and weaknesses but I believe that there is no user problem which couldn't be solved in any one of them. In this connection, I would like to issue a challenge. Can anyone supply a problem, defined in user terms, which can be solved in one of the languages but not in one of the other two?

The reason for specifying "user terms" is that it isn't difficult to find language techniques, like "a$ = b$+c$" in BASIC, or the use of sets in Pascal, which don't have a straight counterpart in the other languages, but programs like Tex, in Pascal, !Edit, in 'C' and Rhapsody in BASIC show that a good programmer can do what is needed with the tools available. The "too many fonts" problem with !Edit also shows that picking a suitable language doesn't guarantee that there won't be any bugs.

If I am right, it is possible to solve any problem in any one of the languages – but it may not always be the best thing to do. "EdScheme", mentioned below, has been written in 'C' and there can be no doubt that many problems can be solved using EdScheme by people who wouldn't know where to start to write a 'C' or Pascal program to do the same task. Similarly, a database language, like that supplied with dBase, makes programming possible for many people who would never dream of tackling one of the standard languages.

I recently received a very nicely worded response to my criticism of the lack of a programmable database for the Archimedes. The writer drew my attention to a product called "Base 5" which can be used in connection with BASIC V to provide many database facilities. While I haven't seen the program, I would suggest that the use of BASIC as an essential part of using it probably rules it out for use in a commercial environment.

The real problem here is that of support. When I support users, at six sites, using dBase, Supercalc and Wordstar, I can normally assume that these programs will work according to the instruction book and, if not, that any bug will be reproducible at any of the other sites. If a user has written a program for dBase or a Macro for Supercalc, I can go back to the book and try to work out why the results achieved are not those which were wanted. If each of the users had added Base 5 to their own BASIC programs, life would be much more difficult and debugging would take much longer. (You would be amazed to find how "thick" otherwise intelligent engineers and accountants can be when faced with a programming language.)

A sensible solution might, of course, be the combination of programs like Base 5 and compiled BASIC programs which could be distributed with an instruction book, and which would not need any programming skills on the part of the user.

EdScheme

On a number of occasions in the past I have mentioned Acorn's LISP, with which you can do things that would be quite difficult in one of the main procedural languages. It is well known for its use in the Artificial Intelligence world but it can have its value to the ordinary user with such things as "fuzzy" databases where many of the subjects have their own particular

characteristics. The problem with LISP is that it is expensive, the program has some serious bugs and the documentation is appalling.

I recently bought a copy of EdScheme which claims to be a modern dialect of LISP. The program comes on a single floppy disk inside a loose-leaf binder containing two manuals; one with 68 pages and the other with 48. The manuals claim to show you how to use this implementation of the language while leaving the job of teaching the language itself to a book, "The Schemer's Guide to Self-improvement", of nearly 400 A4 pages available from the same publishers.

During the last two weeks, I have worked my way through the first 100 pages of the book and typed most of the exercises. There are a few bugs in the program, but they don't cause the computer to crash and I have been able to work my way round all of them so far. The manual has one or two misprints, too, but they become obvious as you try to use it. I spoke to the publishers about the bugs that I have found and it turns out that some of them are, apparently, due to errors in release 2 of the 'C' compiler! The program is being re-compiled with release 3 and updated versions will be sent to registered users with corrected pages for the manual.

Although EdScheme won't print all the digits of factorial 1000, it will let you work with much more precision than most of the normal languages and it isn't difficult to write functions which will let you do exact arithmetic with fractions, thereby avoiding many of the problems of numerical error. There are many other mathematical tasks, such as doing algebraic calculations, which are rather easier in LISP type languages but EdScheme provides Turtle Graphics for those whose interests are pictorial rather than mathematical.

One of the files provided with EdScheme is the code for a "counter" game where the winner is the first to get four counters in a row. The only problem I found with this is that, if you make the computer play as both sides, it is sometimes too fast for you to see what is happening.

The name LISP has sometimes been defined as an acronym of "Lots of Irritating Single Parentheses", and there can be no doubt that one of the biggest problems in learning such a language is the difficulty in matching the parentheses that bound particular parts of a function. EdScheme has an editor which, while being full-screen, shows you as you enter final parentheses what the complete clause will be. Although functions can be typed straight into EdScheme, you will find that you can't edit them if you do, so you will normally enter them via the editor which also provides for the saving and reloading of files of functions. These files can also be edited, externally, in !Edit if you wish.

Full access is provided to operating system commands although it isn't possible to include machine code in EdScheme functions.

While the program isn't multi-tasking, it is well-behaved. You enter the program by double-clicking on its icon and, when you type (quit), you come to the usual message about pressing the space-bar or clicking the mouse.

If you feel like a change from your usual procedural language (and a change is as good as a rest) I can certainly recommend this program and its accompanying book. As you work your way through the book, you are told not just how to use the language but why you might want to do some of the things that are there.

The program costs £37.50, and the book £23, from Lambda Publications of Swindon and I certainly feel that my money was well spent. I am told that a fully Wimp-compatible version is on the cards but completion will, not unreasonably, depend on the amount of support from the Archimedes community.

A540

A week or two ago I had to go to a carrier's depot to pick up an A540 which Paul had sold to me. We came home with it, unpacked it, and found that it wouldn't work with the high-speed mode switched on! It was all right doing such things as playing high-speed patience but if you asked it to do anything clever like loading the example !Draw file it just sulked until it was switched off.

Fortunately, my disappointment didn't last very long. A few days later someone came from Acorn *(the someone being the head of the A540 development team!!! Ed.)* with a new machine and took the old one away. Since then I have had no trouble in making it do all I wanted it to do. There is a sense in

which it is still disappointing; it doesn't look any different from a 440 except for the single numeral on the front and the big SCSI connector on the back.

There is no disappointment, however, when you want to use it for what it is good at. I produced a fifteen page document in Ovation – the difference with things like scrolling was noticeable but the real difference showed when I came to print the results. Fifteen pages in just over 35 minutes instead of a page and a half in 20. Apart from the possibility of adding 4, 8 or even 12M of memory (and I can remember when 48k on a Video Genie seemed massive), it is this speed at things like printing which will pay for it. Editing may not be a lot faster, because your thinking time doesn't alter, but the amount of time that the machine is not available while it prints is where users will notice the benefits.

Strings in Pascal

A recent letter from a reader complained that ISO-Pascal didn't support strings and asked where he could buy an extension that would do the job. This sort of complaint is quite common in programmers who are used to BASIC, in which string functions are provided.

The key to dealing with the problem is to realise that strings are not really a special data type, as in BASIC, but are really just another array which can be accessed by any normal procedure. With this knowledge in mind, it doesn't take long to write procedures that will centre one string in another, insert a string in another or delete part of a string and move the remaining characters up to fill the gap.

The Smith & Wiggins modules, mentioned last month, provide a set of string handling routines and there are the equivalents of the BASIC functions in Cambridge Pascal. Although they are useful, they are not essential, because you can write your own – and extend them to a much more powerful set than those in BASIC. Because Pascal is a compiled language, there isn't the same efficiency difference between your own routines and those provided as standard as there is in interpreted BASIC.

I collected many of my own routines from various textbooks on Pascal, and have extended my collection as the need arose. If anyone would like to send me routines that they have written, especially those that go beyond the basic set, I will include them in later issues of this column. A

Talisman

Steve Hayes

Talisman, from Minerva Software, is a graphic type adventure game. It comes on a copy protected disc and the instructions are contained within the program.

Whilst I do not pretend to be a great adventure player, I have found this adventure quite compelling. The scenario is set in a medieval castle and you are the wizard who is searching for the pieces of talisman. The normal method of retrieving objects and using them in your search applies. In the case of Talisman, when you stumble on an object it is swopped sequentially, and at speed, with the two objects you are already holding. This means that you have to time your movement from the spot where you are standing to end up with the two objects you require. I found this irritating and I felt this method of collection could have been improved upon.

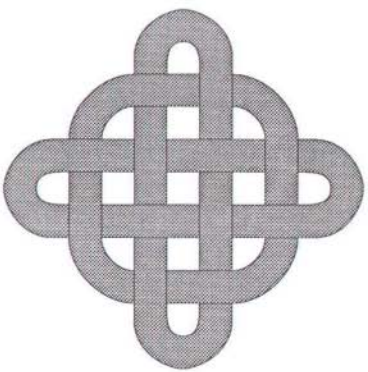
When you have two objects you can freeze the game and use the collected objects to help you on your way. You can join objects together to produce a given result e.g. a hammer and a bent key produces a straight key. Potions can also be made.

Most of the game requires keyboard control of the movements. The graphics and sprites are excellent but the sound is minimal, although this did not prevent me from enjoying the game. Some of the puzzles are quite tricky and it will be some time before I complete it.

All in all, I feel this is one of the better adventures I have played. Apart from my little personal moans about object collection, I would give it maximum marks except for the fact that I haven't been able to complete it yet. Therefore I will give it 9 out of 10 for what I have seen so far. A

The next eight pages may look slightly incongruous but they have been prepared on an Archimedes! It seemed easier to paste them in rather than try to copy all the excellent DTP that Robert has done for us. Ed.

BETTER DTP



Robert Chrismas

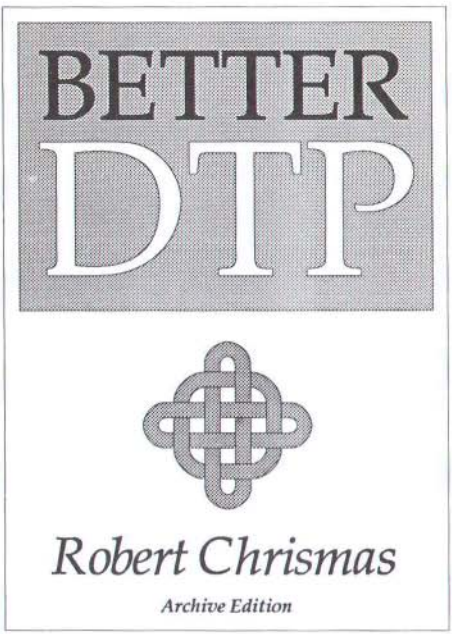
Introduction

Desktop Publishing has become both common and popular. It is an exciting and important application of microcomputers. The introduction of printing with moveable type shaped human history. Now, at last, this power is available to anyone. Professional printers can produce large volumes of printing more cheaply on their expensive equipment, but anyone with a microcomputer and access to a photocopier can do almost all that a printer can.

Well, actually it is not that easy. A good printer has professional training and a wealth of experience to help decide what makes a printed document look 'right'. The enthusiastic amateur has seen lots of printed text, but he/she has probably never looked at the print. We read the words. We are not conscious of the way the print style affects us. Before reading a word we know if something is an advert or a legal document, a newspaper or a business card. Amateur desktop publishing usually looks amateur.

If you want to produce work which looks professional you have to learn some of the printer's skills. I would be sorry if amateurs became so proficient that printers began to go out of work, but at present there seems to be little danger of that. My aim in writing this is to make amateur work a little better, more than this is beyond my ability.

To produce better printing you have to learn some of the printers craft. Printers use a technical vocabulary which is unhelpful and at times lacking in clarity. It may be unfair to accuse printers of deliberately using an obscure vocabulary to preserve 'the secrets of the guild', some sources say that the confusion is the unintentional but inevitable result of a babel of different 'house' jargon. Whatever the truth I reckon it is easier to try to master the terms the trade uses than to try to introduce new terms. So the natural way to proceed seems to be to explain the terms used by professional printers and then to show how an awareness of the features these terms describe can improve an amateur's work.



CONTENTS

Typeface 1

Letter Shapes

We do not usually notice the shapes of the letters in printed material, but these shapes affect and influence us.

Times Roman	ABCDEF... abcdef... 0123... ?!"£#;
Helvetica	ABCDEF... abcdef... 0123... ?!"£#;
Palatino	ABCDEF... abcdef... 0123... ?!"£#;
Avant Garde	ABCDEF... abcdef... 0123... ?!"£#;

Each complete set of letter shapes (capitals, small letters, numerals and punctuation) is given a name. The names are sometimes quaint.

There may be very small variations in letters of a particular style bought from different sources. Sometimes you will find one style with different names (perhaps because of copyright laws).

Equivalent Names

Trinity : Times Roman
Paladin : Palatino
Vogue : Avant Guard
Homerton/ SwissB : Helvetica

Each style usually has a 'bold' (thickened) and an 'italic' (informal, slanting) version. You may also meet other variations, for example 'light' and 'condensed'.

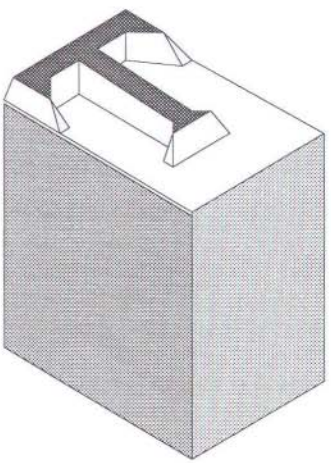
Helvetica	ABCDEF... abcdef
Helvetica Bold	**ABCDEF... abcdef**
Helvetica Italic	*ABCDEF... abcdef*
Helvetica Bold Italic	***ABCDEF... abcedf***

Printers use a number of terms to talk about letter styles. 'Typeface' usually means all of the variations on a particular style. So for example you can talk about the 'Helvetica' typeface. However I have heard some people call each variation a 'typeface' and all the variations together a 'typeface family'. Take care if you buy computer typefaces that you know what the dealer means by a 'typeface'.

'Face' is usually just an abbreviation for 'typeface', but it is also used to refer to typeface groups.

The most common early method of printing used metal blocks with raised letters. Each piece of metal is called a 'type' (or 'sort' or 'stamp'). But 'type' can also mean the shapes produced on the paper.

Printers who use metal type must choose not only the style of characters, but also their size. A 'font' (or 'fount') is all of the type of one size and typeface which a printer would need to set continuous reading matter.



A Stamp

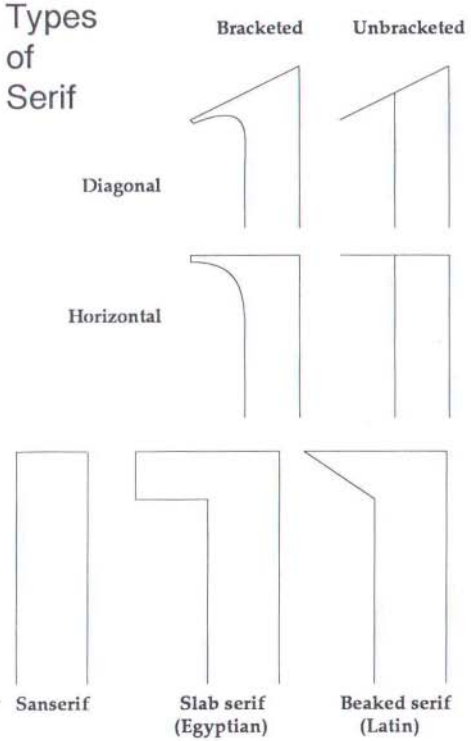
Typeface 2

The letters of the alphabet have very different shapes, but in a good typeface all the letters look as if they belong together. To make the different letter shapes look as though they belong to the same typeface deigners make sure that all the letters have certain features in common. These features are useful for classifying and identifying typefaces.

Serifs

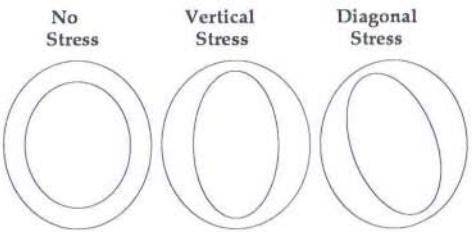
A serif is the hook or beak at the end of a straight stroke. Look at the serif at the top of a letter 'l'. Some typefaces do not have serifs, they are called 'sanserif' (without serif).

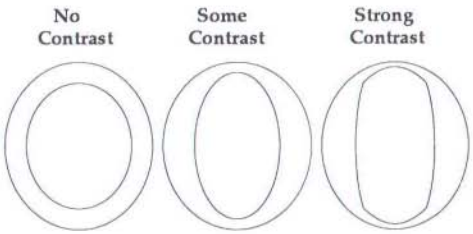
Types of Serif



Stress

In most typefaces the thickness of the lines varies so that vertical lines are thicker than horizontal lines. In some typefaces the thick strokes are much thicker than the thin ones, in others there is not much difference.





Typeface Groups

Some names describe groups of typefaces which share common features. The terms are used loosely, even if some features are absent.

Sanserif/Block/Gothic/Grotesque – sanserif, uniform thickness, no stress

Old Face – bracketed diagnal serifs, some contrast in thickness, diagonal stress

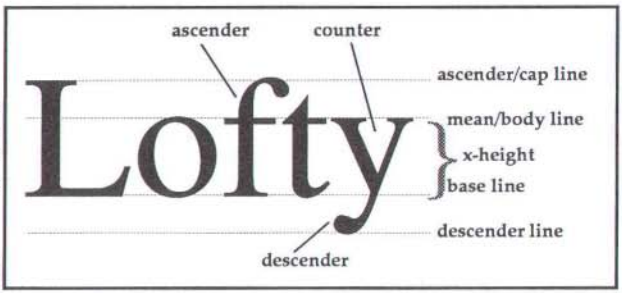
Modern Face – unbracketed horizontal serifs, strong contrast in thickness, vertical stress

Three Dimensional – shadows etc

Ornamental/Fancy – unusual, decorative

Lines and Spaces

Guidelines

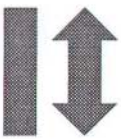


The guidelines determine the height of a font. Ascenders and descenders which are longer than the x-height make a font look more elegant, but the letters are harder to read in small sizes.

Letters with a curve or a point at the top or bottom must be designed so that the curve or point extend slightly outside the guide lines to make them appear the same height as the other letters.

An Optical Illusion

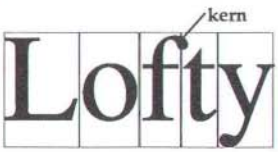
The rectangle looks taller than the arrow shape, to make them appear the same the arrows must be made longer.



Spacing

The letters in a word should not appear unduly spread out or bunched together. With metal type the space between the letters is determined by the size of the stamps. The space after a letter 'f' can appear too wide, so in some typefaces it is made with a small overhanging section. This overhang is called a kern. Computers allow much more accurate spacing, but adjusting the space between letters is still called kerning. Some programs allow the space between any pair of letters to be adjusted, this is called manual kerning. It is not usually worth kerning normal text, but headlines are sometimes improved by kerning.

even
rough



no kerning
some kerning
extreme kerning

Tracking

Typesetters using metal type can increase the space between letters by inserting small metal blocks. This is called tracking. Headings in capitals may be given emphasis by tracking, although not all typesetters like this effect.

On computers tracking may be achieved by negative kerning but with some programs you may have to type spaces between letters. Make sure that the space between words is greater than the space between letters.

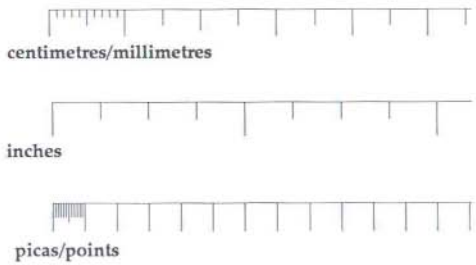
NO TRACKING

SOME TRACKING

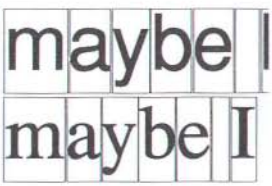
E X T R E M E
T R A C K I N G

Measurements

Printers do not usually use inches or centimetres. The unit of measurement they use is called the 'point'. 72 points measure 0.9962 inches, so for most practical purposes there are 72 point to an inch. A 'pica' is twelve points, and this old term is often used to describe typing which has six characters to an inch.

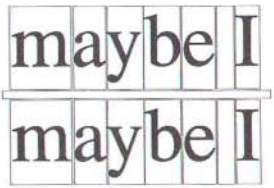


The size of a type is the size of the metal stamp on which the raised letter stands. Some typefaces are designed so that the letters nearly fill the face of the stamp, other typefaces use letters which are much smaller than the face of the stamp. So unless you are familiar with a typeface you can be mistaken about the size of the type. Of course the width of the letters depends on their shape, so a Times Roman 12 point letter 'm' will not be the same width as a Helvetica 12 point 'm'.



You might think that all you need to do to determine a point size is to measure the space between two lines. However printers often add extra space between lines to make the text more readable, or sometimes just to make it fill a bigger area. The spacing pieces are thin strips of lead so the space is called 'leading' pronounced 'ledding'. Most common typefaces are easier to read with some leading.

The size of the leading is often added to the size of the fount so '24 point Bembo set on 28' means the leading is 4 points thick.



The length of the line is called the 'measure'. The measure is often given in picas. A horizontal distance equal to the height of the fount is called an 'm' (or 'mutton') because the type for a letter 'm' is nearly square. Half an 'm' is an 'n' (or 'nut'). If you are using a ten point fount a 'mutton' is ten points and a 'nut' is five points.

When letters were cut on metal designers varied the shape of the letters slightly at different sizes to improve legibility and to make sure the letters printed cleanly. A thin line in a 12 point letter did not get much thinner at 8 point. Computers use just one version of the typeface and scale the letters mathematically so within the limits of the printer the letters are exactly the same shape.

Some printed material is photographically reduced so the type may not be a standard size. In the example below the lines were originally printed in the given sizes.

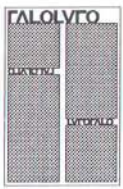
MAGNIFY – magnify	8 point
MAGNIFY – magnify	10 point
MAGNIFY – magnify	12 point
MAGNIFY – magnify	14 point
MAGNIFY – mag ...	18 point
MAGNIFY – ...	24 pnt

Readability 1

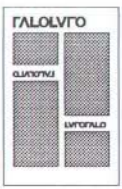
Well designed print looks attractive and is easy to read. It takes time to learn good design, but it is easy to avoid the mistakes which make much desktop publishing look amateur.

Page Layout

Try to think of the page as an abstract design. When we first see a page we may be aware of the words printed in very big fonts, but the main text on the page, the body text, will appear as areas of grey.



too much text



a better layout

Make sure that the page shows enough white space to 'balance' the print. Allow generous margins and space around headings and subheadings. Printers call this 'working white'. If the text does not fit the page, edit it or use another page, do not 'squeeze it in'.

Avoid short lines of type at the tops or bottoms of columns, they can look as though they are not part of the text. Lines which look lost are usually called 'widows' and 'orphans'.

Justification

Full justification gives a page a more formal, regular appearance, but left justification is reckoned to be more readable. Never fully justify lines with an average of five words or less on a line or you will get 'rivers of white' which distract the reader by drawing his eye down the page instead of along the line. If there are less than ten words per line you may need to hyphenate more words.

Heading should not be fully justified. With left justified body text the right margin is not obvious so centred or right justified headings may appear misplaced. Left justified headings usually look better.

Fully justified columns can be placed closer together than left justified columns because the gaps between the columns (the gutters) are more obvious but be careful that the page does not look so dense and dark that the reader is discouraged.

Rivers of White

The dotted line marks a river.

Very short lines should not be fully justified because this causes 'rivers' which will distract the reader. This column exaggerates the effect, but rivers will reduce readability even when they are not as obvious as this.

Justification

Left Justified

This column is left justified. The right hand ends of the lines are ragged. This format is sometimes called 'un-justified'. With short lines like this it may help to hyphenate some words.

Right Justified

This column is right justified. The left hand ends of the lines are left ragged. This style is not often used, but headings may be right justified and you may find that captions on the left of pictures look better right justified.

Centred

This column is centred. Some poetry may be centred, but it is hard to read because the eye finds it difficult to jump to the start of a new line. Headings are often centred.

Fully Justified

This column is fully justified. It is sometimes just called justified. Extra spaces are inserted between the words and sometimes the letters to make all the lines the same length. It gives a page a formal look.

Readability 2

Fonts

Choose fonts to distinguish headlines, subheadings, body text and captions. You do not have to use different typefaces, variation can be achieved using different font sizes and by using bold or italic styles. Do not use too many fonts on a page. It depends on what kind of document you are printing, but more than five fonts on a page usually looks fussy and amateur, and at least one writer recommends no more than three.

The more normal or conventional a font looks the easier it will be to read. There is some evidence than suggests that adults find fonts with serifs easier to read quickly. Sans serif fonts look simple and straightforward and are often used for headings, captions and tables. Young children find sans serif letters easier to recognise.

Avoid very fancy typefaces, they are usually ugly and always hard to read.

Most people find fonts smaller than 12 point increasingly hard to read. Ten point is about the limit for normal use unless the typeface is especially clear. Fonts of 16 point and bigger can make a large area of text look childish.

Measure

Long lines are hard to read. Do not exceed an average of twelve words on a line. An average of ten words (50 characters) is the maximum for comfortable reading. Lines no longer than three of four words can be read comfortably, but they should not be fully justified and unless you use frequent hyphenation the line endings will look ragged.

Leading

A good rule of thumb is to use leading of 20% of the font size. So give a 10 point font 2 points of leading. If you are using a long measure increasing the leading will make the text more readable; with a short measure you can reduce the leading.

The more leading you use the lighter the text will look but this also depends on the font and the justification.

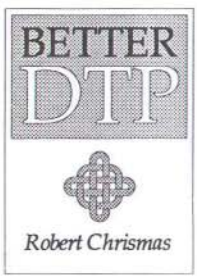
The leading may also be adjusted slightly to help the text fit the page.

Finally

In documents with more than one page be consistent in you use of layout, justification, fonts, measure and leading.

These rules will help you to avoid many common mistakes, but good design must be learnt from the best examples and from practice. Try to become aware of the way type is used and to look at it with a critical eye. When you do this you will find times when the rules should be broken, and you will begin to be able to trust your eye and your judgement instead of a set of rules.

The best printing will not increase the worth of poor text. Presentation is important but good ideas and clear prose come first.



Tiny Draw & Tiny Logo

Tim Hicks

Tiny Draw and Tiny Logo are designed for Infant/Junior children aged 4 – 9. The programs have been available for nearly a year on the Nimbus and this is an implementation for the Archimedes/A3000.

The disc and documentation (two pamphlets) come in a slim wallet. The reason for two pamphlets is that the original instructions for the Nimbus have been included, with an update for the Archimedes. The quality of print is in fact better on the update than the original produced by Northamptonshire. Hopefully, Topologika will produce one well-printed manual in the future.

Owing to copyright regulations, the disc (or more sensibly a backup of the disc) has to be installed before it can be used. Despite an initial reaction of "what a nuisance!", the process is quite painless as it is explained well in the notes. These notes, by the way, are not intended for children.

Once the program is running, it is almost self-explanatory, and explanations come best from another pupil than from a busy teacher! Before starting either program, there is an option to reconfigure it, e.g. no diagonals or numbers above five in Tiny Logo or no gallery in Tiny Draw. Obviously, a teacher would need to know the program (and the children!) before changing the configuration which has the easiest method I have yet come across.

Neither program runs in the desktop window environment. Some might object to this but I think it is sensible in schools to use the whole screen since this means that pupils are not distracted by the icon bar. I appreciate that this could be a nuisance in the home situation – once your child is using Tiny Draw you've lost the whole of the computer with no sharing possible! Both programs support colour printers but I was unable to test this facility.

Tiny Draw

This program starts by displaying pictures that have already been drawn in the "Gallery". Children will enjoy seeing their past masterpieces displayed here but one can move quickly on by pressing a mouse button. The screen changes to the drawing area (in black to begin with but easily changed by the fill option). On the left are eighteen colours and at the bottom are five windows, one to show the colour chosen and the other four for tools. The keyboard is redundant for both programs and I found children soon became used to the mouse.

My son, aged nine, needed about one minute's explanation – then he was away. I decided to let him show his brother how to use it so that I could see if one child could teach another. I had intended to load the program for them but they started up and were drawing before I got anywhere near the computer. Any child from about the age of four can use Tiny Draw and instruct the next child. The results seem a little rough to the adult eye and the program is limited (with two sizes only for the pencil and four set shapes, for example). The rubber is difficult to use with any precision and the fill jug must be used with care. The one facility I would like to see in any upgrade is an undo button. It is very disheartening when you are drawing carefully to have the whole picture ruined by the fill option because there was a tiny hole in the boundary.

Tiny Logo

This needs more explanation than Tiny Draw. For those not familiar with Logo, the idea is to give commands that move a cursor around the screen. In full implementations one can do much more than program the cursor but Tiny Logo is an excellent introduction to the basic philosophy behind Logo.

There are no angles to worry about (children using this disc would hardly have met the word angle, let alone know how to use one) and again the choice of instructions is carefully limited. One needs to read the manual first for this program.

On entering Tiny Logo, the screen consists of a working area with an optional grid (28 by 20 squares) with arrows and numbers at the top, colours to the right, a store under the working area and friendly matchstick men to the left. The manual fails to mention that there are two ways of using this version of logo: with or without the store. I would strongly recommend that the store is not used until the child is well acquainted with the rest of the program.

Others might disagree here, for the store is the whole point of the exercise!

One can program the cursor, gradually building up a series of commands, then execute these commands quickly, or slowly or in between – hence the match-stick men running, crawling and walking! The snag with Tiny Logo is that it is tedious to drag the mouse for every command from the top to the bottom of the screen. What is needed is a key that toggles the store off or on. The store will also become full quite quickly with only 10 or 20 commands allowed. I personally would prefer an arrow and number together in each box thus paving the way for dart and other logo implementations.

I have mentioned that there is no undo button in Tiny Draw. The same applies here and it is the one feature this program needs. If one forgets to drag just one symbol into the store (by executing it immediately) the stored commands are then useless for the picture on the screen. The rubber symbol wipes out every command in the store. What is needed is for the delete button to wipe out the most recent command until the error is reached. Apart from this it is well thought out and a delight to use when the commands are all safely stored. Every child will love the hooter which mercifully is more subdued on the Archimedes than on the Beeb!

Summary

Both these programs do what they are designed to do extremely well. It is important to remember that they are meant for young children as an introduction to drawing and logo. The disc will be excellent value in schools with more than one Archimedes as there is no restriction on backups within the same building. Site licences are available and Cleveland has bought it for all its primary schools as well as secondary schools that have special needs classes. There is talk of an upgrade "sometime in the future" but I think the programs are good value for money as they are now.

Tiny Draw & Tiny Logo together £29.95 including VAT (not available separately) from Topologika, PO Box 39, Stilton, Peterborough PE7 3RL. A

Lingenuity (Lindis)	P.O.Box 10, Halesworth, Suffolk, IP19 0DX. (0986–85–476) *(–460)*
Micro-Aid	Kildonan Courtyard, Barrhill, Girvan, S. Ayrshire, KA26 0PS. (0465–82288)
Minerva Systems	Minerva House, Baring Crescent, Exeter, EX1 1TL. (0392–437756) *(–421762)*
MJD Software (p16)	13 Burnham Way, London, W13 9YE. (081–567–4284)
Oak Computers (p14)	Cross Park House, Low Green, Rawdon, Leeds, LS19 6HA. (0532–502615) *(–506868)*
Shenley Software	5 Coombefield Close, New Malden, Surrey, KT3 5QF. (081–949–3235)
Silicon Vision Ltd	Signal House, Lyon Road, Harrow, Middlesex, HA1 2AG. (081–422–2274) *(–427–5169)*
Software Solutions	Broadway House, 149–151 St Neots Road, Hardwick, Cambridge, CB3 7QJ. (0954–211760) *(–211760)*
Techsoft UK Ltd (p12)	Old School Lane, Erryrs, Mold, Clwyd, CH7 4DA. (082–43318)
The Advisory Unit	Endymion Road, Hatfield Herts, AL10 8AU. (07072–65443) *(273651)*
The Serial Port	Burcott Manor, Wells, Somerset, BA5 1NH. (0243–531194) *(–531196)*
Topologika	P.O. Box 39, Stilton, Peterborough, PE7 3RL. (0733–244682)
Type Mismatch	3 Tankerton Road, Whitstable, Kent, CT5 2AB.
XOB (p5)	Balkeerie, Eassie by Forfar, Angus, DD8 1SR. (0307–84364)
ZCL Ltd	Unit 1, Ringway Industrial Estate, Eastern Avenue, Lichfield, Staffs. (0543–416626)

Fact-File

(The numbers in *italic* are fax numbers.)

4th Dimension	P.O. Box 4444, Sheffield. (0742–700661)
4mation	Linden Lea, Rock Park, Barnstaple, Devon, EX32 9AQ. (0271–45566)
Abacus Training (p37)	29 Okus Grove, Upper Stratton, Swindon, Wilts, SN2 6QA.
Acorn Computers Ltd	Fulbourn Road, Cherry Hinton, Cambridge, CB1 4JN. (0223–245200) *(–210685)*
Ace Computing (p6)	27 Victoria Road, Cambridge, CB4 3BW. (0223–322559)
Aleph One Ltd (p31)	The Old Courthouse, Bottisham, Cambridge, CB5 9BA. (0223–811679) *(–812713)*
Apricote Studios (p13)	2 Purls Bridge Farm, Manea, Cambridgeshire, PE15 0ND. (035–478–432)
Arxe Systems Ltd	P.O.Box 898, Forest Gate, London E7 9RG. (081–534–1198 evenings)
Atomwide Ltd (p17)	23 The Greenway, Orpington, Kent, BR5 2AY. (0689–838852) *(–896088)*
Base5 (p18)	PO Box 378, Woking, Surrey GU21 4DF.
Beebug Ltd	117 Hatfield Road, St Albans, Herts, AL1 4JS. (0727–40303) *(–60263)*
Calligraph Ltd (p28)	53 Panton Street, Cambridge CB2 1HL. (0223–461143)
Cambridge International Software	8 Herbrand Street, London, WC1N 1HZ. (071–833–4023) *(071–837–6077)*
CJE Micros	78 Brighton Road, Worthing, W Sussex, BN11 2EN. (0903–213361) *(–213901)*
Clares Micro Supplies	98 Middlewich Road, Rudheath, Northwich, Cheshire, CW9 7DA. (0606–48511) *(–48512)*
Colton Software (p32)	149–151 St Neots Road, Hardwick, Cambridge, CB3 7QJ. (0954–211472) *(–211607)*
Computer Concepts (p26/27)	Gaddesden Place, Hemel Hempstead, Herts, HP2 6EX. (0442–63933) *(–231632)*
Dabs Press	22 Warwick Street, Prestwich, Manchester, M25 7HN. (061–773–8632) *(773–8290)*
David Pilling	P.O.Box 22, Thornton Cleveleys, Blackpool, FY5 1LR
Dudley Micro Services (p25)	32 Osborne Road, Penn, Wolverhampton, WV4 4AY. (0902–342214 / 334315)
ECD Computers B.V.	Voldersgracht 25_26, 2611 EV Delft, Holland.
EMR Ltd	14 Mount Close, Wickford, Essex, SS11 8HG. (0702–335747)
G.A.Herdman Educational	43 Saint Johns Drive, Clarborough, Retford, Notts, DN22 9NN
Ian Copestake Software	10 Frost Drive, Wirral, L61 4XL. (051–648–6287)
Ivoryash Ltd	14 Perwell Close, Bredon, Tewkesbury, Gloucester, GL20 7LJ. (0684–73173)
Lambda Publications	194 Cheney Manor Road, The Green, Swindon SN2 2NZ.

Norwich Computer Services 96a Vauxhall Street, Norwich, NR2 2SD. (0603-766592) *(Fax 764011)*

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- The Latest Technical Information
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